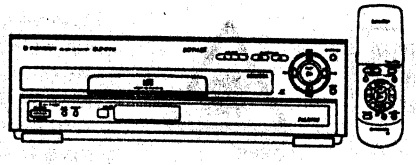
PIONEER
The Art of Entertainment

Service Manual



ORDER NO.
RRV1356

CD CDV LD PLAYER
CLD-D515

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model	Power Requirement	Remarks
	CLD-D515		
WBW	○	AC220-240V	
WPW	○	AC220-240V	
WEZ	○	AC220-240V	

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PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE, INC. P.O. Box 1760, Long Beach, CA 90801-1760, U.S.A.
PIONEER ELECTRONIC (EUROPE) N.V. Haven 1087, Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE PTE. LTD. 501 Orchard Road, #10-00 Lane Crawford Place, Singapore 0923

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1. SAFETY INFORMATION

(FOR EUROPEAN MODEL ONLY)

VARO!
AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSATEILYLLE. ÄLÄ KATSO SÄTEESEEN.

ADVERSEL:
USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGÅ UDSAETTELSE FOR STRÅLING.

VARNING!
OSYNLIG LASERSTRÅLNING NAR DENNA DEL AR OPPNAD OCH SPÄRREN AR URKOPPLAD. BETRAKTA EJ STRÅLEN.

LASER
Kuva 1
Lasersateilyn varoitusmerkki

WARNING!
DEVICE INCLUDES LASER DIODE WHICH EMITS INVISIBLE INFRARED RADIATION WHICH IS DANGEROUS TO EYES. THERE IS A WARNING SIGN ACCORDING TO PICTURE 1 INSIDE THE DEVICE CLOSE TO THE LASER DIODE.

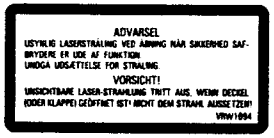
IMPORTANT
THIS PIONEER APPARATUS CONTAINS LASER OF CLASS 1.
SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

LASER DIODE CHARACTERISTICS
MAXIMUM OUTPUT POWER: 5 mw
WAVELENGTH: 780-785 nm

LASER
Picture 1
Warning sign for laser radiation

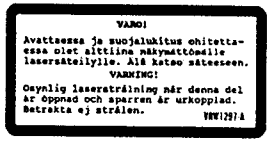
LABEL CHECK

WEZ type

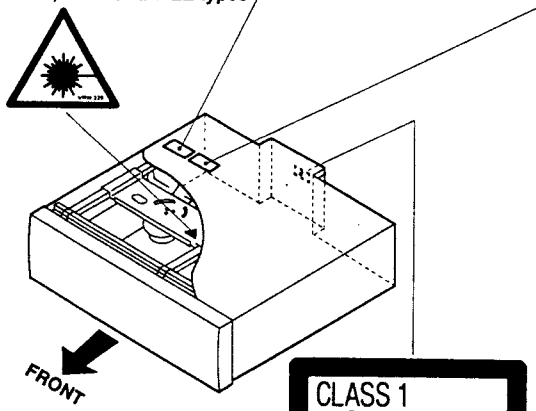


WBW and WPW types

WEZ type



WBW, WPW and WEZ types



WBW, WPW and WEZ types

Additional Laser Caution

1. The ON/OFF statuses of the side-A/B detection switch (TURN switch on the TNSB assy), slider-position detection switches (INNER and OUTER on the PKSB assy) and loading-status detection switches (SW 1, 2 and 3 on the LMSB assy) are detected by the microprocessor (IC101 in the MOTHER assy). To permit the laser diode to oscillate, it is required to set the side-A/B detection switch for side A status (TRN : OFF) and the slider-position detection switch for the LD ACTIVE status (INNER : OFF, OUTER : OFF), and to set the loading-status detection switch for tilt neutral state (SW1 : OFF, SW2 : OFF, SW3 : ON). As long as these requirements are not satisfied, the laser diode will not oscillate. When the requirements are met in any way, the laser diode can oscillate. The laser diode oscillation will continue if pin 13 of IC801 is shorted to GND or the emitter and collector of Q834 are shorted each other (fault condition) in MOTHER assy.
   In the test mode ＊, the laser diode oscillates when the microprocessor detects a PLAY signal, or when the PLAY key is pressed (S209 ON in the KEYB assy), with the above requirements satisfied.
2. When the cover is open, close viewing through the objective lens with the naked eye will cause exposure to a Class 1 laser beam.

＊ : Refer to page 58, 57.

2. EXPLODED VIEWS, PACKING AND PARTS LIST

NOTES:
- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *Parts list without notice are common for CLD-D515/WBW, WPW and WEZ.*

2.1 EXTERIOR AND DISC TRAY SECTION

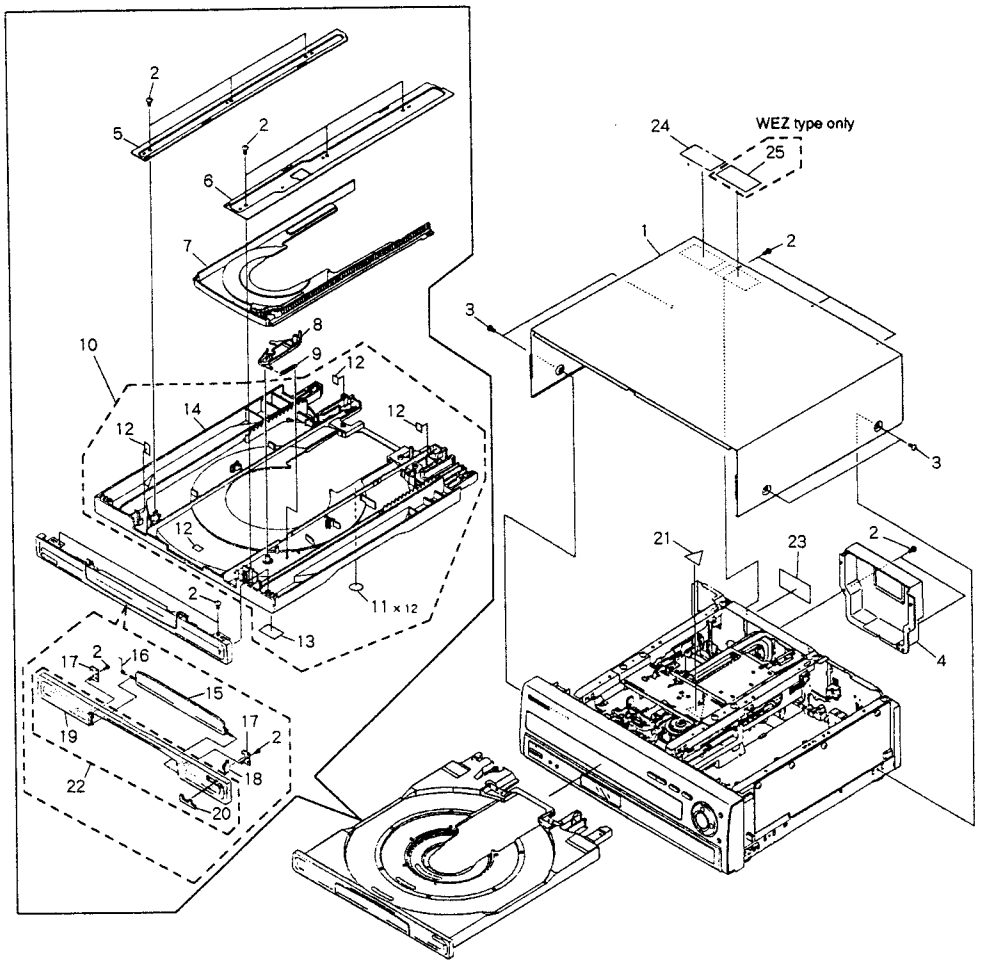
(1) CONTRAST OF CLD-D515/WBW, WPW and WEZ

CLD-D515/WBW, WPW and WEZ have the same construction except for the following:

Mark	No.	Symbol & Description	Part No.			Remarks
			CLD-D515/WBW	CLD-D515/WPW	CLD-D515/WEZ	
	24	Caution label	PRW1018	PRW1018	VRW1094	
	25	Caution label HE	Not used	Not used	VRW1297	

(2) PARTS LIST FOR CLD-D515/WBW

Mark	No.	Description	Part No.
	1	Bonnet S	VXX2252
	2	Screw	BBZ30P080FMC
	3	Screw	BCZ40P060FZK
	4	Rear cover	VNK3272
	5	Guide plate (R)	VNE1939
	6	Guide plate (L)	VNE1938
	7	CD tray	VNK3007
	8	Lock plate	VNL1703
	9	Lock plate spring	VBH1188
	10	Tray assy-S	VXX2307
	11	Cushion	VEC1682
	12	Damp Cushion	VEC1683
NSP	13	Label	VRW1289
	14	LD tray assy	VXA2173
	15	CD door assy	VXA2190
	16	Door spring	VBH1248
	17	Door holder	VNE1967
	18	Damper assy	VXA1999
	19	Tray panel	VNK2993
	20	Laser disc badge	VAM1029
	21	Caution label (G)	VRW-329
	22	Tray panel assy-S	VXX2286
NSP	23	Label	VRW-328
	24	Caution label	PRW1018
	25	• • • • •	



NOTE: Screws adjacent to ▼ mark on the product are used for disassembly.

2.3 FRONT PANEL SECTION

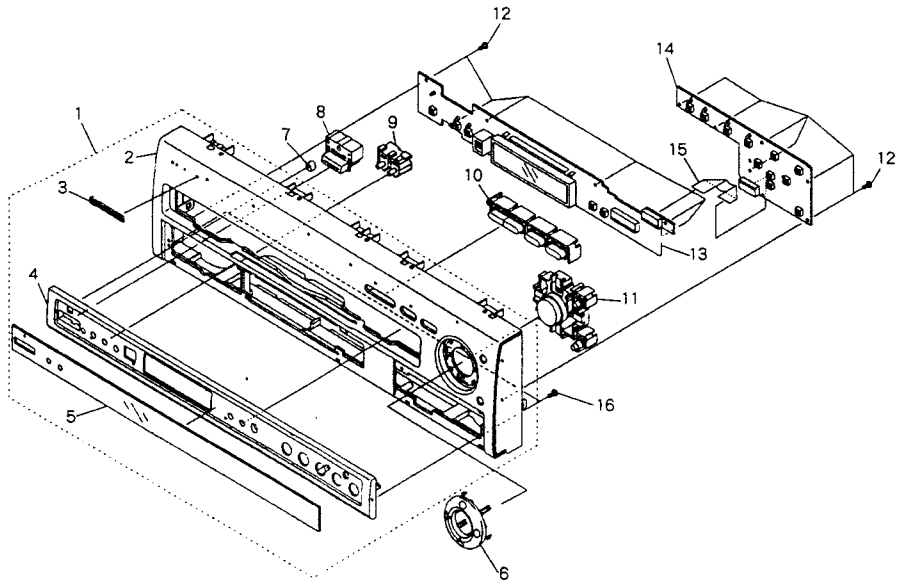
(1) CONTRAST OF CLD - D515/WBW, WPW and WEZ

CLD - D515/WBW, WPW and WEZ have the same construction except for the following:

Mark	No.	Symbol & Description	Part No.			Remarks
			CLD - D515/WBW	CLD - D515/WPW	CLD - D515/WEZ	
	1	Front panel assy - S	VXX2293	VXX2384	VXX2293	
	5	FL lens	VEC1818	VEC1819	VEC1818	

(2) PARTS LIST FOR CLD - D515/WBW

Mark	No.	Description	Part No.
	1	Front panel assy - S	VXX2293
NSP	2	Front panel	VNK3193
	3	Name plate	VAM1032
NSP	4	Sub panel	VNK3071
	5	FL lens	VEC1818
	6	Key A	VNK2793
	7	LED lens	PNW2019
	8	Power button	VNK2329
	9	L key C	VNK3070
	10	L key	VNK2987
	11	Main key	VNK2995
	12	Screw	BBZ30P080FMC
	13	FLKY assy	VWG1658
NSP	14	KEYB assy	VWG1659
	15	Flexible cable 13P	VDA1496
	16	Screw	BPZ30P080FCC



2.4 BOTTOM VIEW SECTION

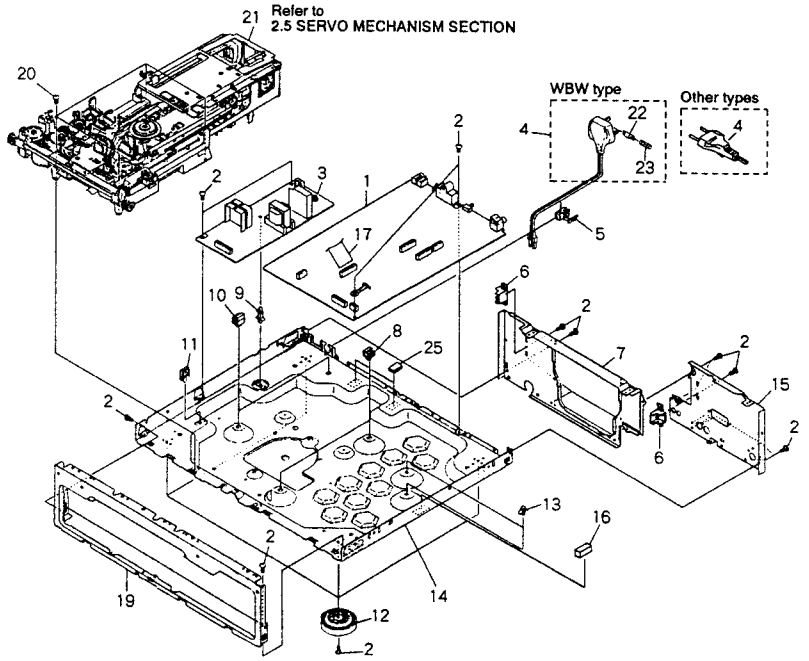
(1) CONTRAST OF CLD - D515/WBW, WPW and WEZ

CLD - D515/WBW, WPW and WEZ have the same construction except for the following:

Mark	No.	Symbol & Description	Part No.			Remarks
			CLD - D515/WBW	CLD - D515/WPW	CLD - D515/WEZ	
⚠	4	AC power cord	VDG1063	VDG1065	VDG1061	
⚠	22	Fuse (T5A)	PEK1003	Not used	Not used	
	23	Fuse holder	VKR1003	Not used	Not used	

(2) PARTS LIST FOR CLD - D515/WBW

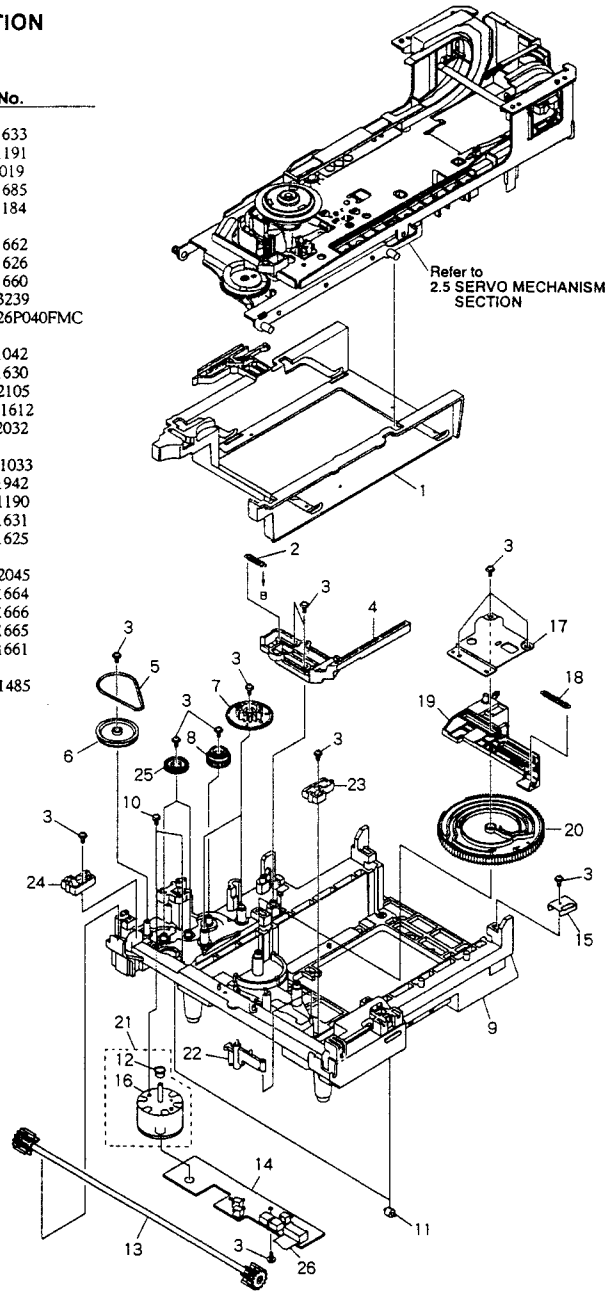
Mark	No.	Description	Part No.
	1	MOTHER assy	VWS1197
	2	Screw	BBZ30P080FMC
⚠	3	SYPS assy	VWR1234
⚠	4	AC power cord	VDG1063
⚠	5	AC cord stopper	CM - 22B
	6	Tray stopper	VNL1657
	7	Rear panel (R)	VNA1506
NSP	8	P plate holder	PNY - 405
NSP	9	PC support	VEC - 269
NSP	10	PCB hinge	VEC1174
NSP	11	Wire clip (H)	VEC1181
	12	Insulater	PNW1912
	13	Card spacer	VEC1708
NSP	14	Chassis	VNA1461
	15	Rear panel (L)	VNA1575
NSP	16	Spacer	REB1171
	17	Flexible cable (21P)	VDA1465
	18	• • • • •	
NSP	19	Panel holder	VNA1507
	20	Screw	BBZ30P100FMC
NSP	21	Mechanism assy	VWT1128
⚠	22	Fuse (T5A)	PEK1003
	23	Fuse holder	VKR1003
	24	• • • • •	
NSP	25	Rubber spacer	VEB1252



2.6 LOADING MECHANISM SECTION

Parts List

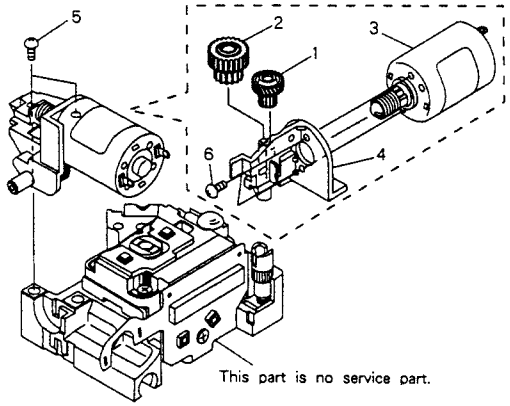
Mark	No.	Description	Part No.
	1	Clamp cam	VNL1633
	2	CDP spring	VBH1191
	3	Screw	Z39-019
	4	CD plate	VNL1685
	5	Rubber belt	VEB1184
	6	Gear pulley	VNL1662
	7	Twin gear	VNL1626
	8	Center gear	VNL1660
	9	Mechanism base	VNK3239
	10	Screw	BMZ26P040FMC
	11	Roller	VNL1042
NSP	12	Motor pulley	VNL1630
	13	Synchro gear assy	VXA2105
NSP	14	LMSB assy	VWG1612
	15	Cam holder	VNE2032
NSP	16	Carriage motor	VXM1033
	17	Shaft holder	VNE1942
	18	CAS spring	VBH1190
	19	Cam plate	VNL1631
	20	Cam gear	VNL1625
	21	Loading motor assy	VXX2045
	22	MB-SW lever	VNL1664
	23	Slider (R)	VNL1666
	24	Slider (L)	VNL1665
	25	Double gear	VNL1661
	26	Flexible cable (12P)	VDA1485



2.7 CARRIAGE ASSY

Parts List

Mark	No.	Description	Part No.
	1	CA gear (A)	VNL1638
	2	CA gear (B)	VNL1639
	3	Slider motor assy	VXX2082
	4	M holder	VNL1700
	5	Screw	PBZ20P050FMC
	6	Screw	PMZ20P030FMC



2.8 PACKING

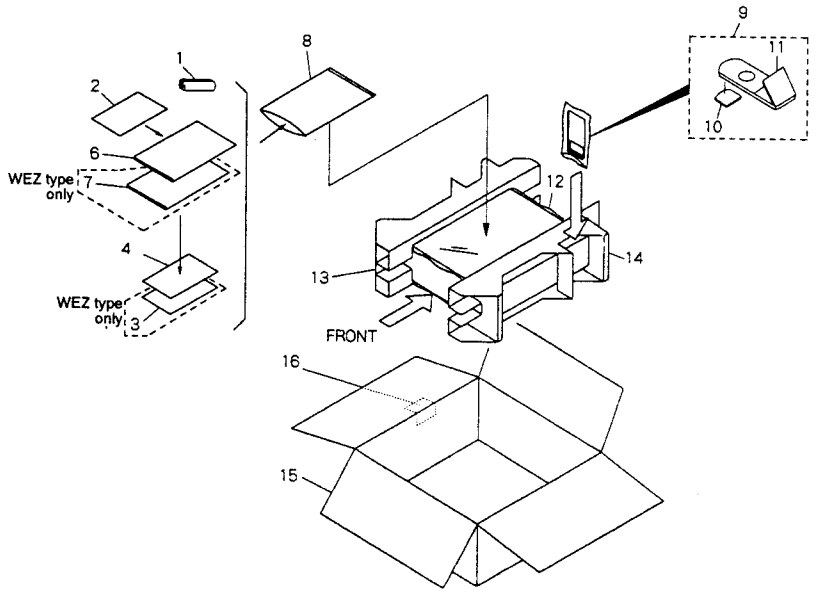
(1) CONTRAST OF CLD-D515/WBW, WPW and WEZ

CLD-D515/WBW, WPW and WEZ have the same construction except for the following:

Mark	No.	Symbol & Description	Part No.			Remarks
			CLD-D515/WBW	CLD-D515/WPW	CLD-D515/WEZ	
NSP	2	Warranty card	ARW-088	PRY1002	ARW-088	
NSP	3	Caution	Not used	Not used	VRR1009	
	4	Caution	VRR1020	VRR1020	VRM1027	
	7	Operating instructions (Dutch/Swedish/Spanish/Portuguese)	Not used	Not used	VRF1035	

(2) PARTS LIST FOR CLD-D515/WBW

Mark	No.	Description	Part No.
NSP	1	Battery (R03, AAA)	VEM-022
NSP	2	Warranty card	ARW-088
	3	• • • • •	
	4	Caution	VRR1020
	5	• • • • •	
	6	Operating instructions (English/French/German/Italian)	VRE1036
	7	• • • • •	
NSP	8	Polyethylene bag	VHL-014
	9	Remote control unit	VXX2246
	10	Battery cover	VNK2805
	11	Upper cover	VNK2828
	12	Mirror mat	VHL1027
	13	Protector	VHB1010
	14	Protector B	VHB1022
	15	Packing case	VHG1448
	16	Caution label	VRM1044



3. SCHEMATIC AND PCB CONNECTION DIAGRAMS

3.1 OVERALL CONNECTIONS, KEYB, FLKY, PKSB, FG, TNSB, BISB, LMSB AND CARRIAGE ASSEM

NOTE FOR SCHEMATIC DIAGRAMS (Type 4A)

1. **When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".**

2. **Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.**

3. **RESISTORS:**
   Unit: k:kΩ, M:MΩ, or Ω unless otherwise noted.
   Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
   Tolerance:(F):±1%, (G):±2%, (K):±10%, (M):±20% or ±5% unless otherwise noted.

4. **CAPACITORS:**
   Unit : p:pF or μF unless otherwise noted.
   Ratings : capacitor (μF) / voltage (V) unless otherwise noted.
   Rated voltage : 50V except for electrolytic capacitors.

5. **COILS:**
   Unit : m:mH or μH unless otherwise noted.

6. **VOLTAGE AND CURRENT:**
   ▭ or ←V :
   DC voltage (V) in PLAY mode unless otherwise noted.
   ⇦mA or ←mA :
   DC current in PLAY mode unless otherwise noted.
   Value in ( ) is DC current in STOP mode.

7. **OTHERS:**
   - ◎ or ◉ : Adjusting point.
   - ◀ : Measurement point.
   - The ⚠ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.

8. **SCH – □ ON THE SCHEMATIC DIAGRAM:**
   - SCH–□ indicates the drawing number of the schematic diagram. (SCH stands for schematic diagram.)

9. **SWITCHES** (Underline indicates switch position):

LMSB ASSY
- S101 : SW1
- S102 : SW2
- S103 : SW3

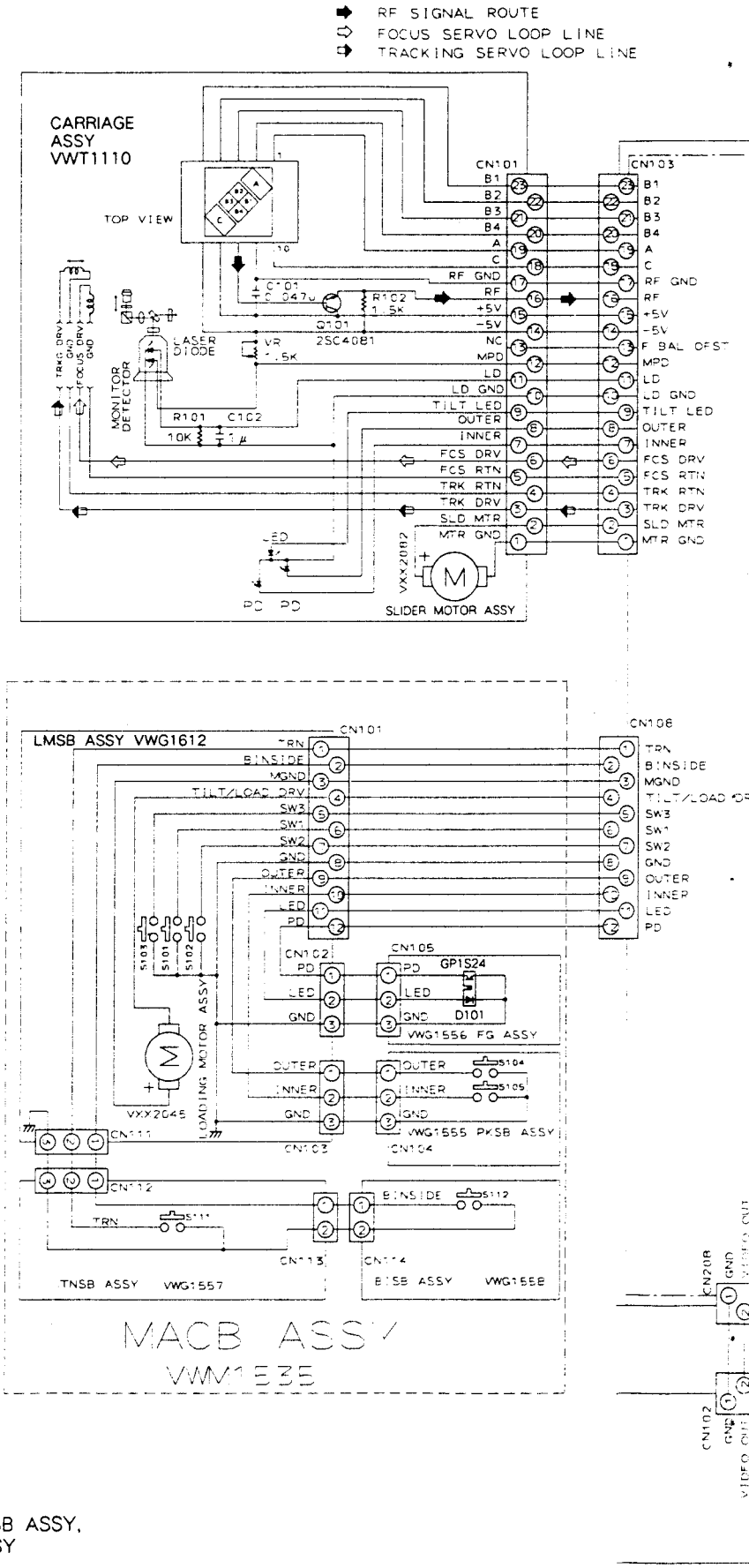
PKSB ASSY
- S104 : OUTER SW
- S105 : INNER SW

TNSB ASSY
- S111 : TURN

BISB ASSY
- S112 : B INSIDE

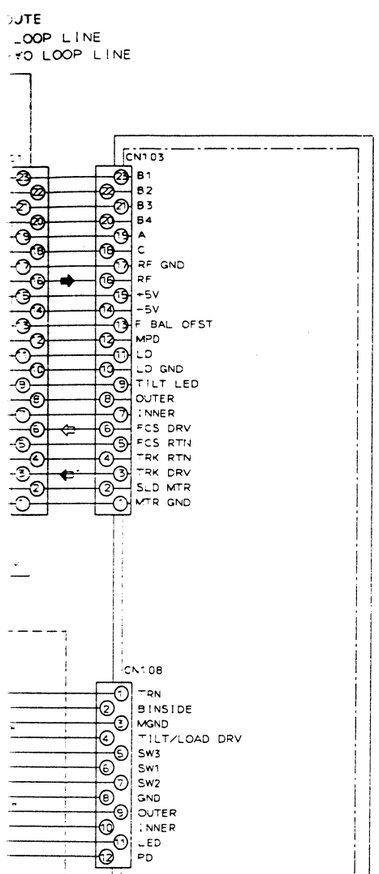
KEYB ASSY
- S201 : DISC SIDE A
- S202 : DISC SIDE B
- S203 : CD OPEN/CLOSE (▲)
- S204 : LD OPEN/CLOSE (▲)
- S205 : STOP (■)
- S206 : SHARPNESS
- S207 : REV (◀◀ / ⏮)
- S208 : FWD (⏭ / ▶▶)
- S209 : PLAY (▶)
- S210 : PAUSE (❚❚)
- S211 : MENU

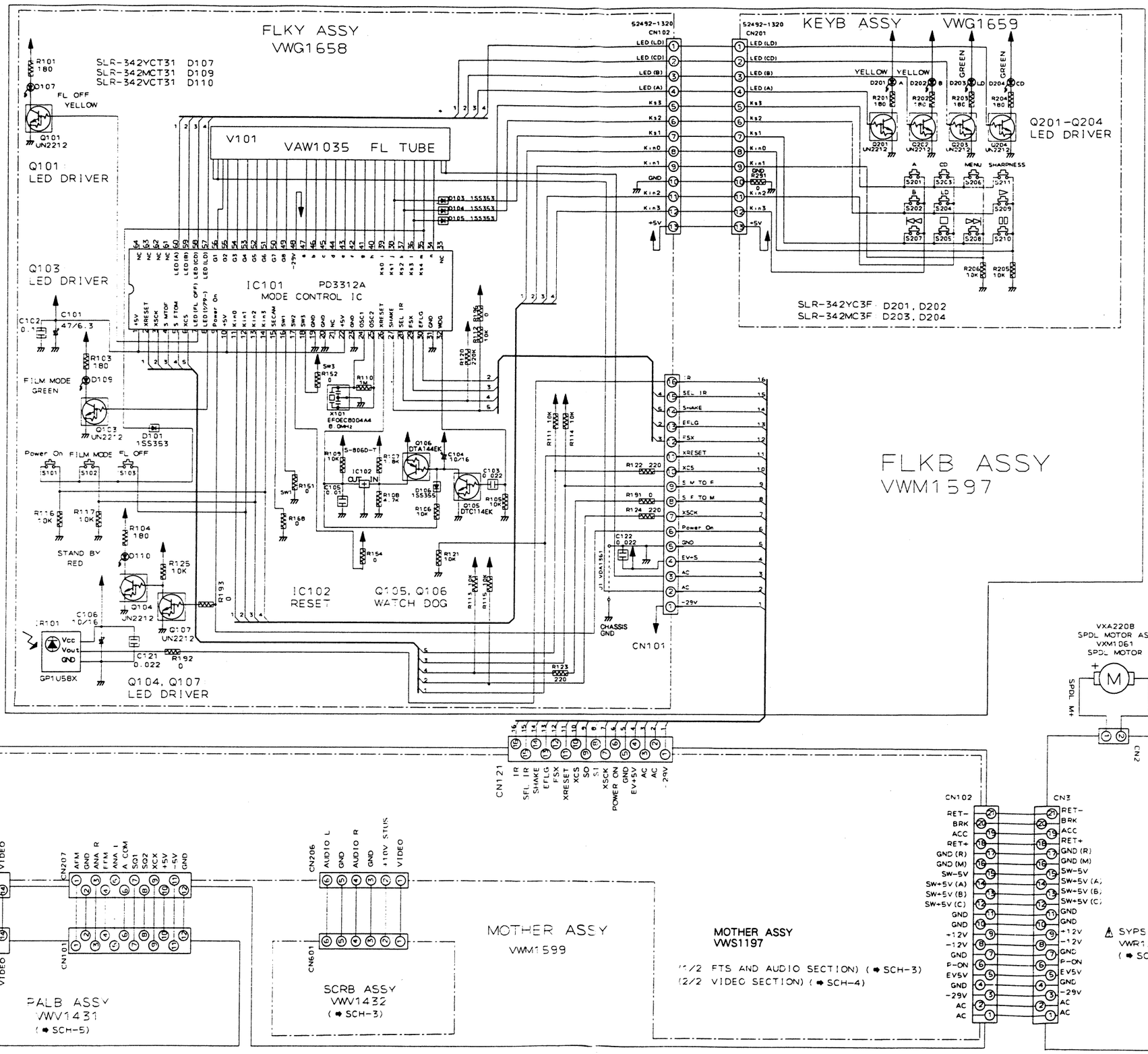
FLKY ASSY
- S101 : POWER STANDBY/ON
- S102 : FILM MODE
- S101 : DISPLAY OFF



SCH-1 OVERALL CONNECTIONS, KEYB ASSY, FLKY ASSY, PKSB ASSY, FG ASSY, TNSB ASSY, BISB ASSY, LMSB ASSY, CARRIAGE ASSY

CARRIAGE ASSEMBLIES

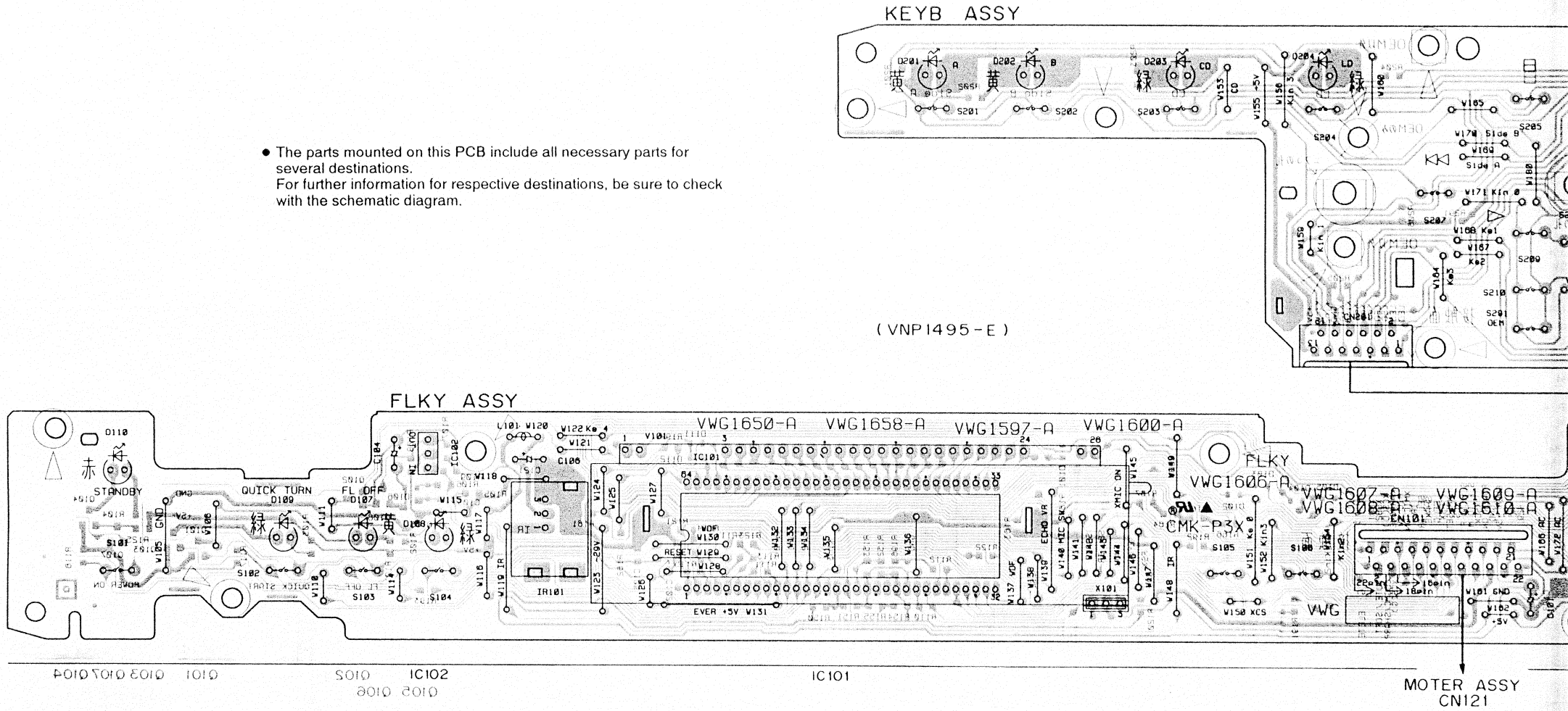


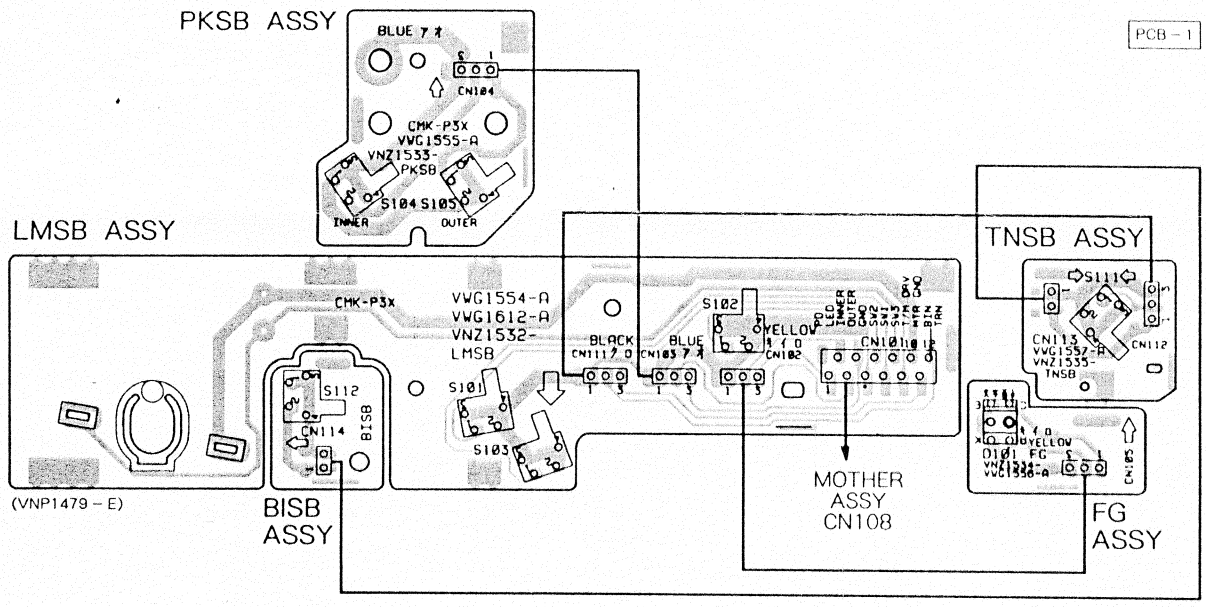


SCH - 1

OVERALL CONNECTIONS, KEYB ASSY,
FLKY ASSY, PKSB ASSY, FG ASSY, TNSB ASSY,
BISB ASSY, LMSB ASSY, CARRIAGE ASSY

SCH-1





- The parts mounted on this PCB include all necessary parts for several destinations.
  For further information for respective destinations, be sure to check with the schematic diagram.

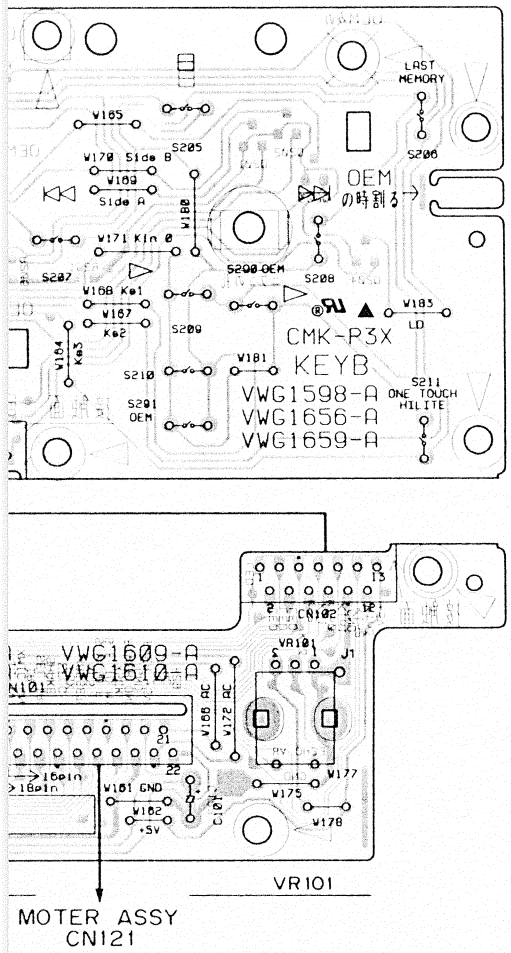
- This diagram is viewed from the mounted parts side.

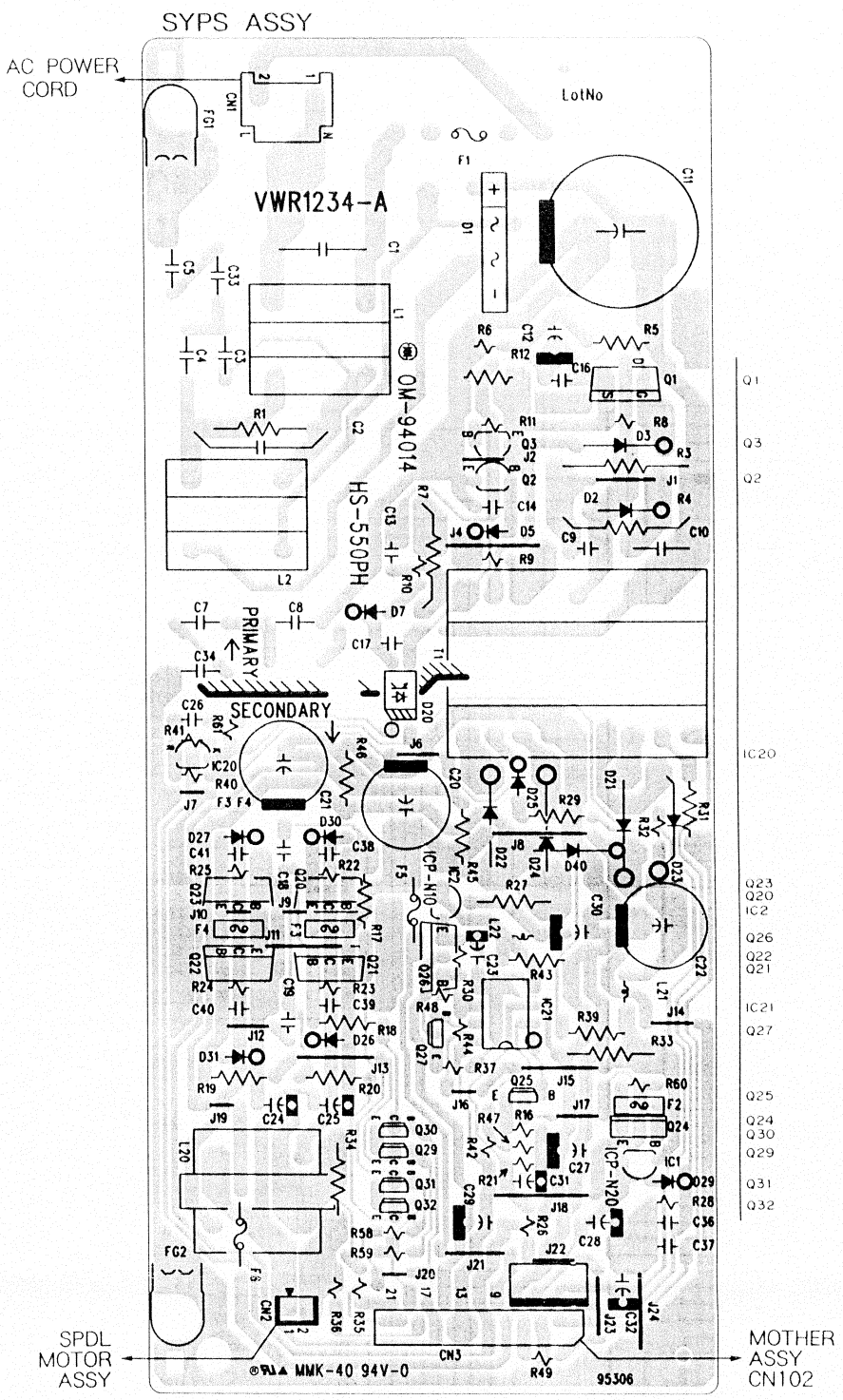
NOTE FOR PCB DIAGRAMS:

1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

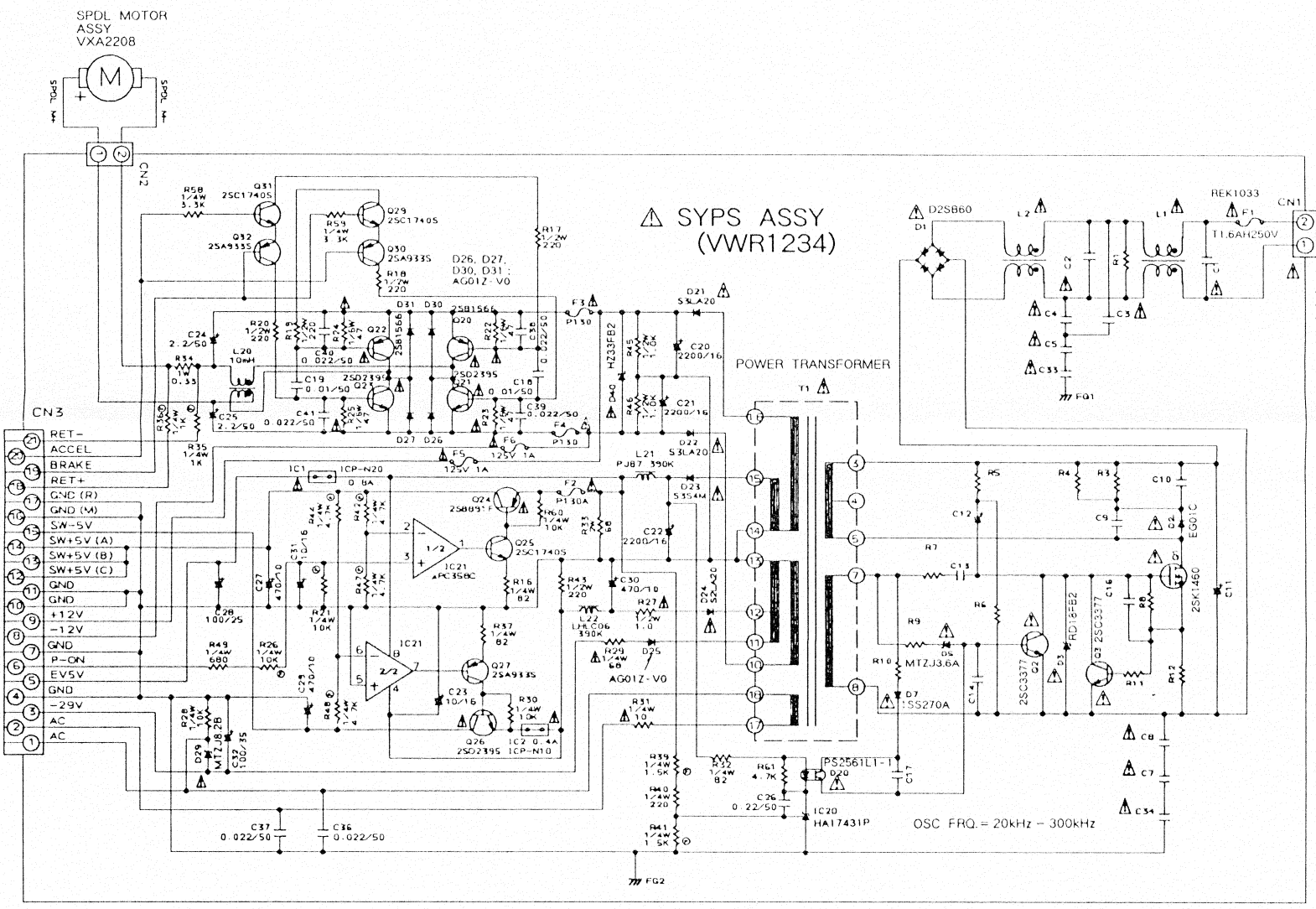
Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
B C E	B C E B C E	Transistor
B C E	B C E B C E	Transistor with resistor
D G S	D G S D G S	Field effect transistor
		Resistor array
		3-terminal regulator

3.2 SYPS ASSY





- This diagram is viewed from the mounted parts side.



SCH - 2

3.3 MOTHER ASSY (1/2 : FTS AND AUDIO SECTION) AND SCRB ASSY

SCH-3 MOTHER ASSY (1/2), SCRB ASSY

MOTHER ASSY (1/2) (VWS1197)
• FTS & AUDIO SECTION

: RF SIGNAL LINE
: FOCUS SERVO LOOP LINE
: TRACKING SERVO LOOP LINE
: VIDEO SIGNAL LINE
: AUDIO SIGNAL LINE
(D): DIGITAL AUDIO SIGNAL LINE
(A): ANALOG AUDIO SIGNAL LINE

SCH - 3

J10 J10
+5V ① ① +5V
GND ② ② GND
+12V ③ ③ +12V
−12V ④ ④ −12V

PALB ASSY CN102 (➡SCH-5)
PALB ASSY CN101 (➡SCH-5)

D/A CONVERTER
IC201 TC9400F
MCK GNDD RESET LZ GNDA LO LO VDA RO RO GNDA RZ VDD
GNDX XI XO VDX P/S LATCH SHIFT ATT DATA BCK LRCK

IC202 LOW PASS FILTER
IC202 8A4560F

2PD601A R (Q202)
2PD601A L (Q201)
UN2112 (Q208)
UN2112 (Q209, Q210, Q211, Q212)
UN2212 (Q207)
UN2212 (Q206)
Q206, Q207 : AUDIO MUTE
Q204, Q205 AUDIO MUTE

DAC+5V
NJM78L08A IC206
NJM79L08A IC207

Q512, Q513 : VIDEO 75Ω DRV.
2SC1740S Q512
2SC1740S Q513
CN206 VIDEO S+10V GND Rch GND Lch
VIDEO OUT
JA1 VKB1090

SCRB ASSY (VWV1432)
CN601 RCA VIDEO +10V STUS GND AUDIO R GND AUDIO L
JA16 V OUT GND +10V STUS GND L OUT R OUT

IC905, IC906 SPDL ERROR DETECT

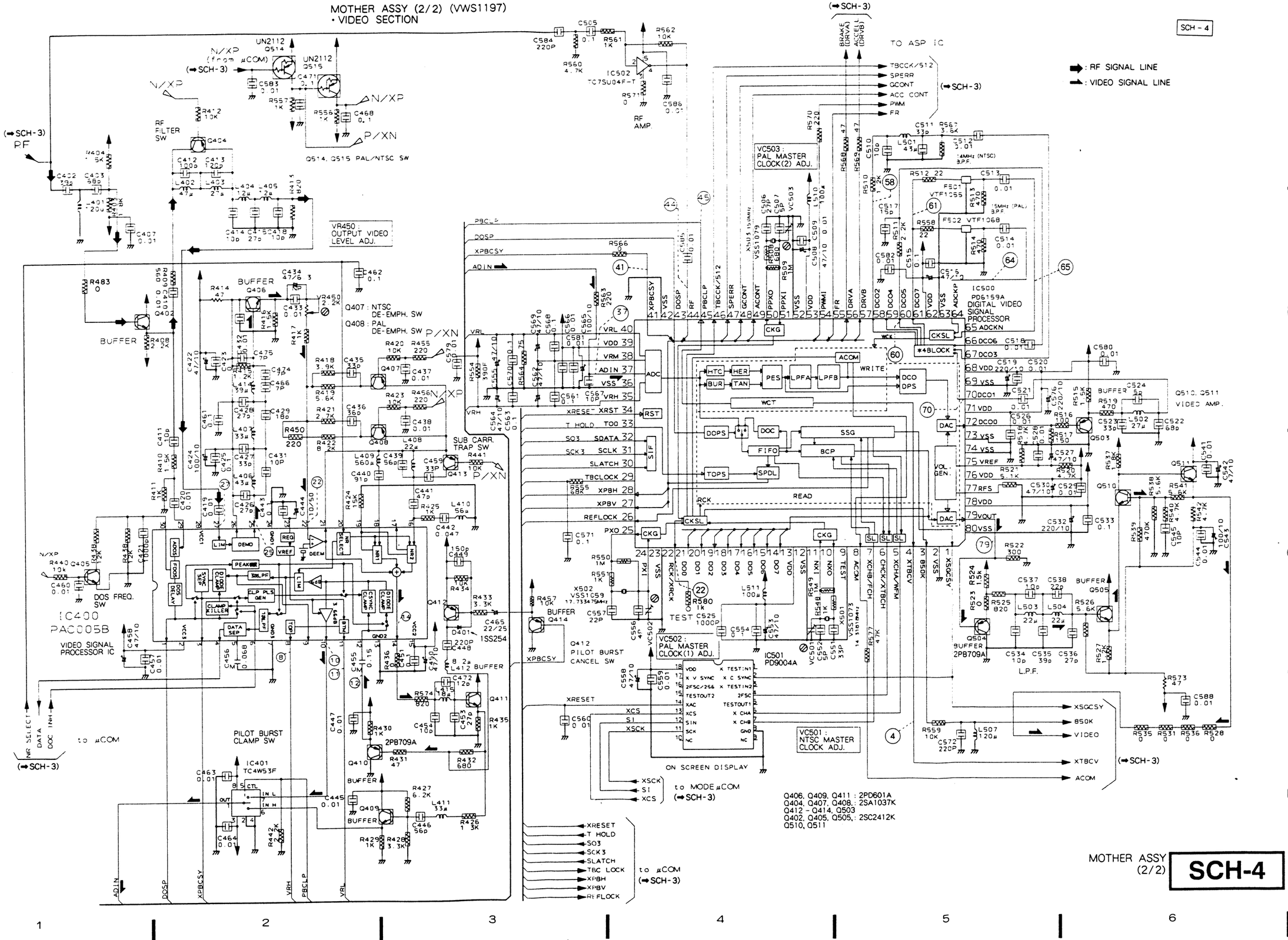
IC901 PAC003A
Q901: UN2212
Q917 LIMITTER
Q908 GAIN CONT.
2PB709A
1SS254
VCO
PLL OFFSET
TP PLL OFFSET

IC901 SERVO CONTROL IC
PAC003A
to DVP (➡SCH-4)

MOTHER

MOTHER ASSY (1/2), SCRB ASSY
SCH-3

3.4 MOTHER ASSY (2/2 : VIDEO SECTION)



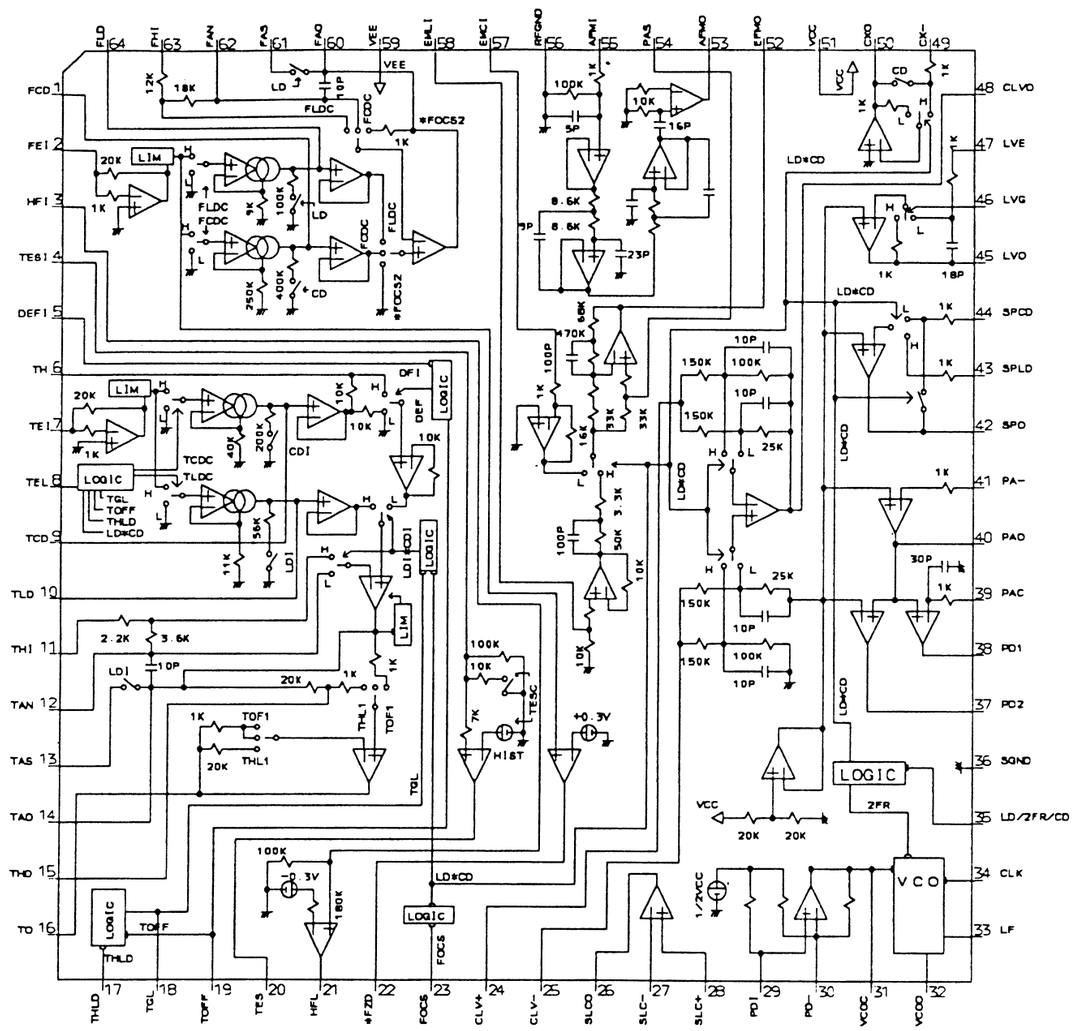
WAVEFORMS AND VOLTAGE
FTS AND AUDIO SECTION

Note : (No.) in the table correspond to the pin number.

Measurement condition : In case when (D. audio) is written, at time when disc that has digital audio recording is played.

IC801(PAC002A)	IC802(LC78681KE)	IC803(LA6510)	IC901(PAC003A)	CN106	Video output pin
②, ③ 1mS/Div. 16mVp-p AC mode	② 0.1μS/Div. 4.3Vp-p AC mode(D audio)	① 2mS/Div. 1.8Vp-p 0V DC mode	② 0.2mS/Div 74mVp-p 0V DC mode	①, ② 5mS/Div. 65mVp-p 0V DC mode	① approx. 1Vp-p (75Ω termination) V 20mV/Div H 10mS/Div
⑦, ⑧ 1mS/Div. 67mVp-p 0V DC mode	㉝ 10μS/Div. 4.2Vp-p AC mode(D audio)		⑦ 0.2mS/Div. 74mVp-p 0V DC mode	③ 0.5mS/Div. 300mVp-p AC mode	
⑨ 5mS/Div 0.1Vp-p 0V DC mode	㉟ 0.2μS/Div 4.4Vp-p AC mode(D audio)		⑯ 0.2mS/Div. 0.61Vp-p 0V DC mode	④ 5mS/Div. 15Vp-p 0V DC mode	
	㊱ 0.2μS/Div 4.5Vp-p AC mode(D audio)		㊽ 50μS/Div 6.2Vp-p 0V DC mode	⑤ 5mS/Div. 5.8Vp-p 0V DC mode	
	㊸ 0.1μS/Div. 4.5Vp-p AC mode(D audio)		㊷ 0.2μS/Div. 2.1Vp-p AC mode	⑥ 5mS/Div. 3.5Vp-p 0V DC mode	
	㊾ 0.1μS/Div. 2Vp-p AC mode(D audio)		㊼ 1mS/Div 0.53Vp-p 0V DC mode	⑨ 5mS/Div. 1.25Vp-p 0V DC mode	
			㊽ 0.2mS/Div. 0.32Vp-p 0V DC mode	⑪ 10mS/Div. 1.7Vp-p DC mode	

● **The inside block diagram of IC901 (PAC003A)**



PCB - 3

MOTHER ASSY

PALB ASSY CN101

PALB ASSY CN102

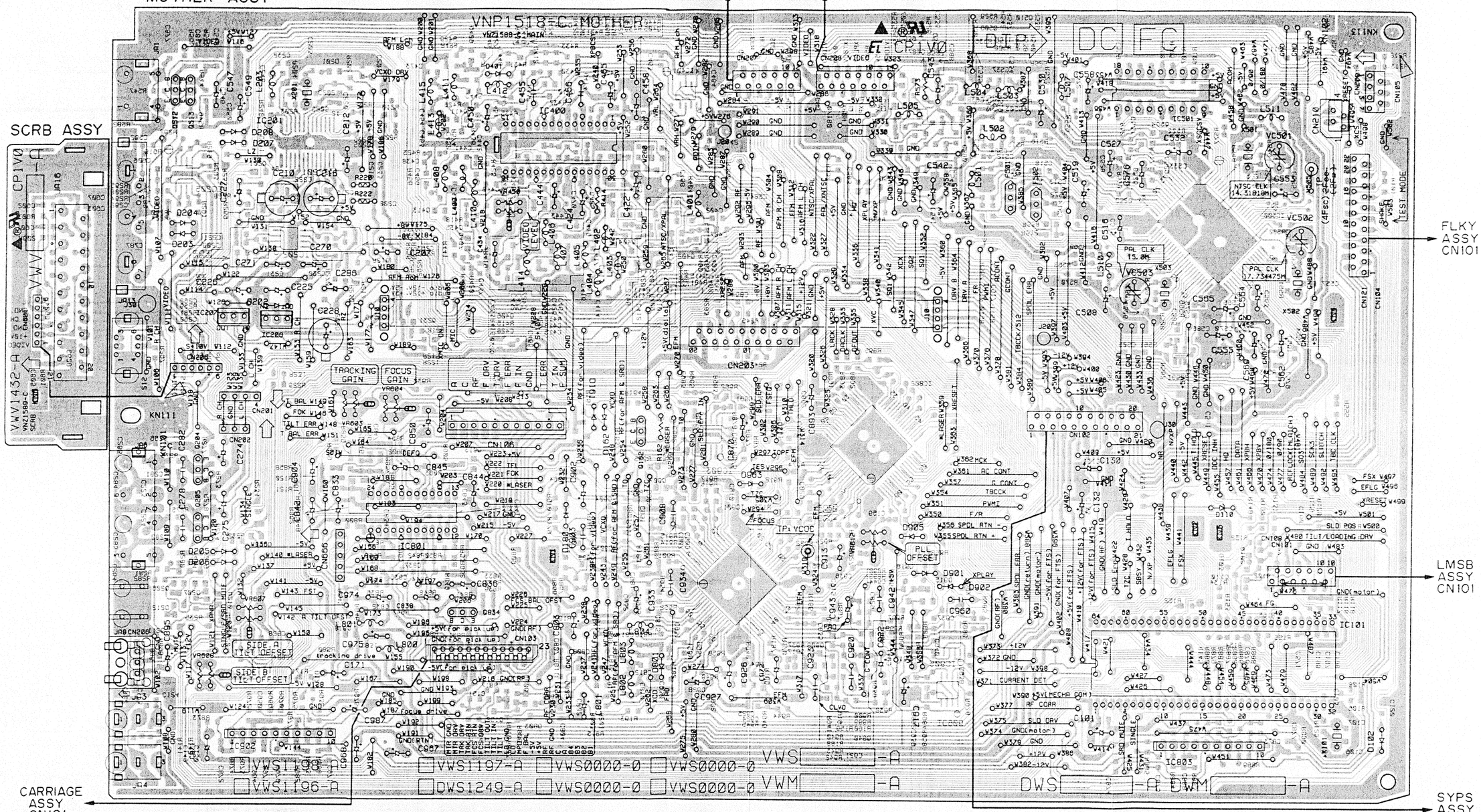
SCRB ASSY

FLKY ASSY CN101

LMSB ASSY CN101

CARRIAGE ASSY CN101

SYPS ASSY CN3



- This diagram is viewed from the mounted parts side.
- The parts mounted on this PCB include all necessary parts for several destinations.
  For further information for respective destinations, be sure to check with the schematic diagram.

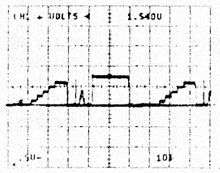
WAVEFORMS AND VOLTAGE

PALB ASSY

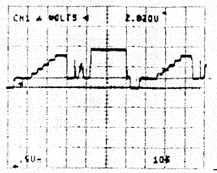
Note : (No.) in the table correspond to the pin number.

IC602 (NJM2209S)

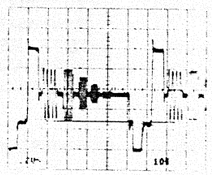
② FREQ. CHARACTERISTIC COMPENSATION
V : 0.5V/Div H : 10µS/Div



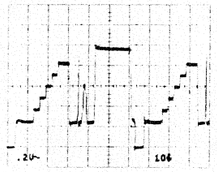
④ PHASE DELAY
V : 0.5V/Div H : 10µS/Div



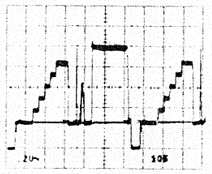
⑥ VIDEO OUT (SHARPNESS OFF)
V : 0.2V/Div H : 10µS/Div



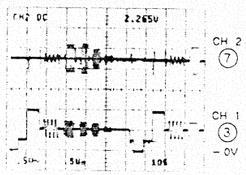
③ VIDEO IN
V : 0.2V/Div H : 10µS/Div



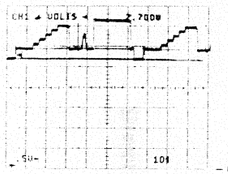
⑥ VIDEO OUT (SHARPNESS ON)
V : 0.2V/Div H : 10µS/Div



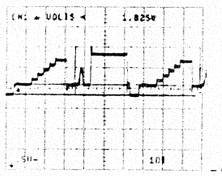
⑦ DIFFERENTIAL IN (SHARPNESS ON)
V : 0.5V/Div H : 10µS/Div



③ VIDEO IN
V : 0.5V/Div H : 10µS/Div



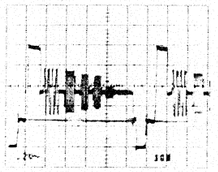
⑥ VIDEO OUT (SHARPNESS ON)
V : 0.5V/Div H : 10µS/Div



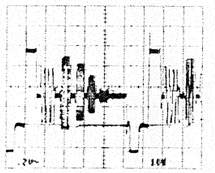
Pin	SHARPNESS	
	ON	OFF
9	2.4V	1.6V

Pin 1 is DC 5V

③ VIDEO IN
V : 0.2V/Div H : 10µS/Div



⑥ VIDEO OUT (SHARPNESS ON)
V : 0.2V/Div H : 10µS/Div



IC202 (MM1130XD)

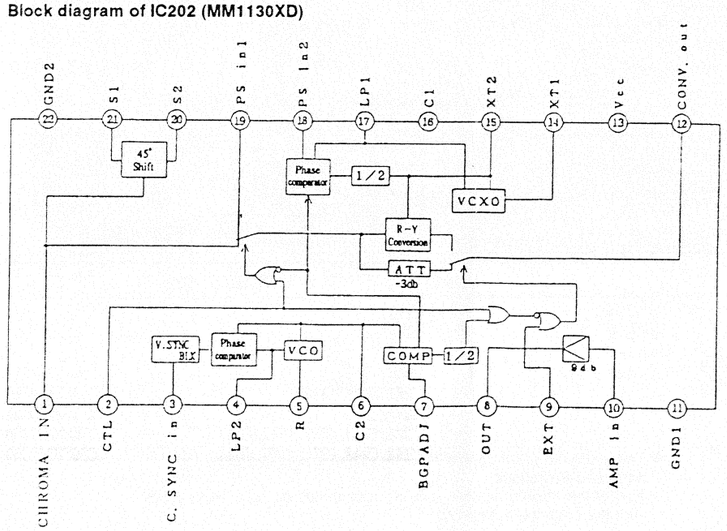
① 0.5Vp-p, 63.5µS — Color bar

③ 5.3µS, 5.0Vp-p, 63.5µS, 0V

⑧ 0.5Vp-p, 63.5µS — Color bar

⑩ 180mVp-p, 63.5µS — AC mode Color bar

Block diagram of IC202 (MM1130XD)



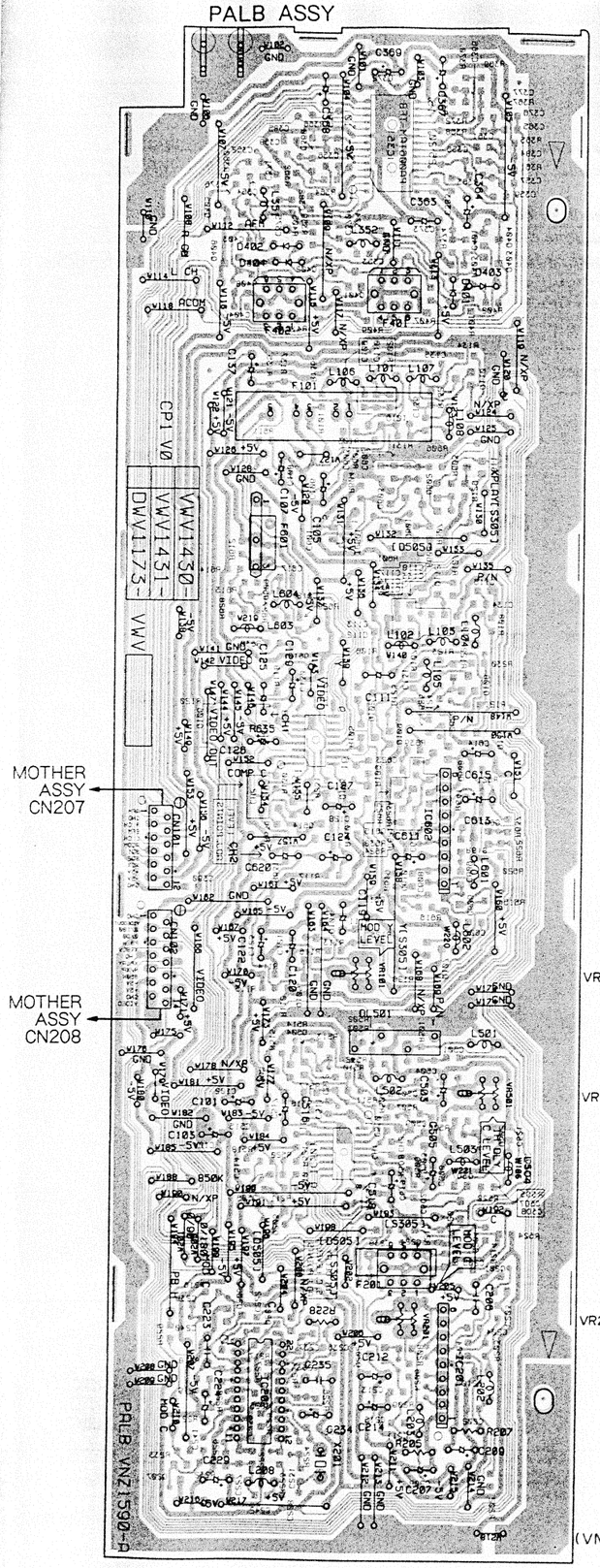
Note : These waveforms voltages are in the NTSC test disc play mode.

IC202 (MM1130XD)

Pin No.	Voltage (V)	Pin No.	Voltage (V)
1	3.2	12	2.6
2	–	13	5.0
3	–	14	3.0
4	2.0	15	3.7
5	2.1	16	3.7
6	1.9	17	2.6
7	1.8	18	3.3
8	2.9	19	3.3
9	0	20	3.3
10	2.6	21	3.3
11	0	22	0

PALB ASSY

PCB – 4

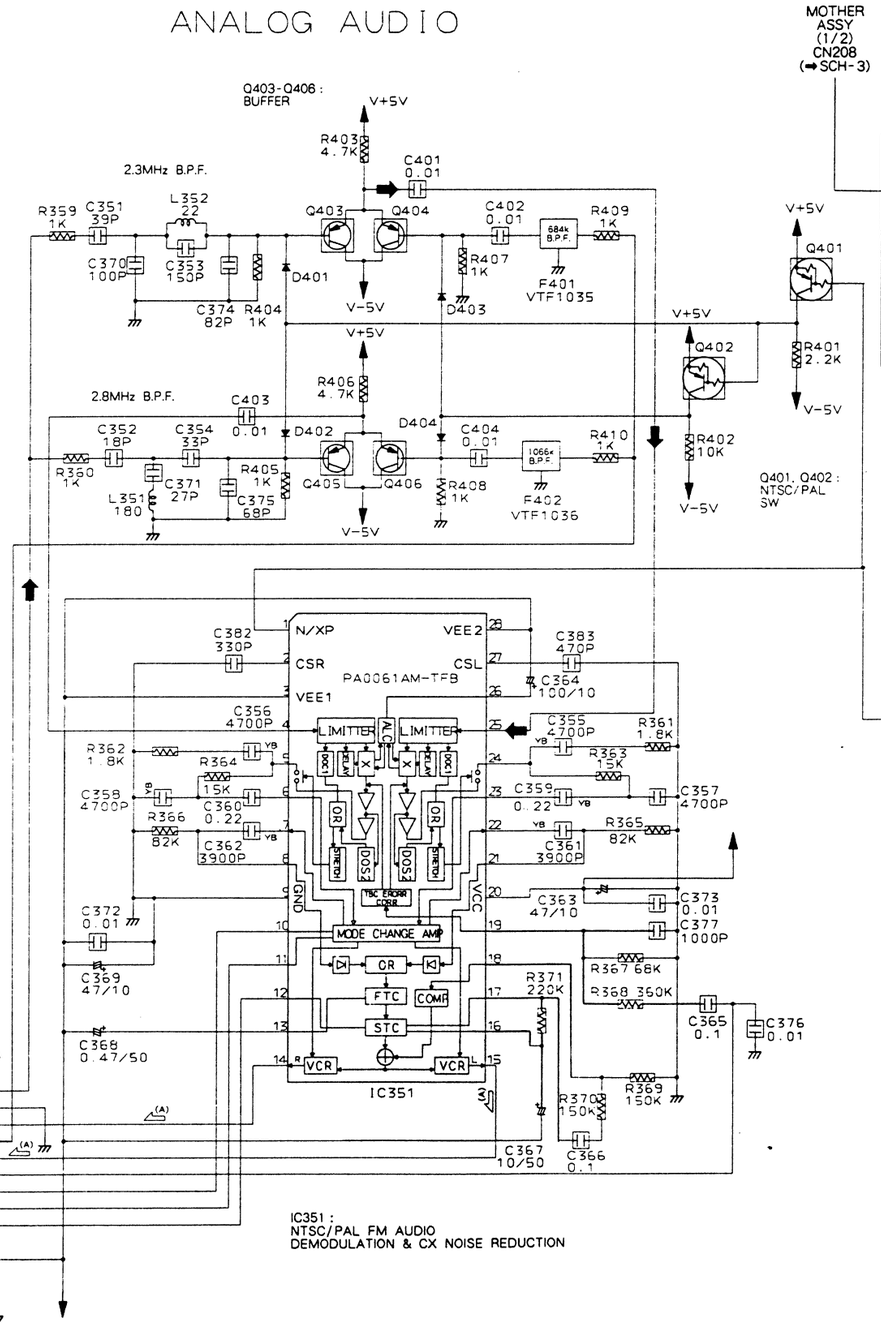


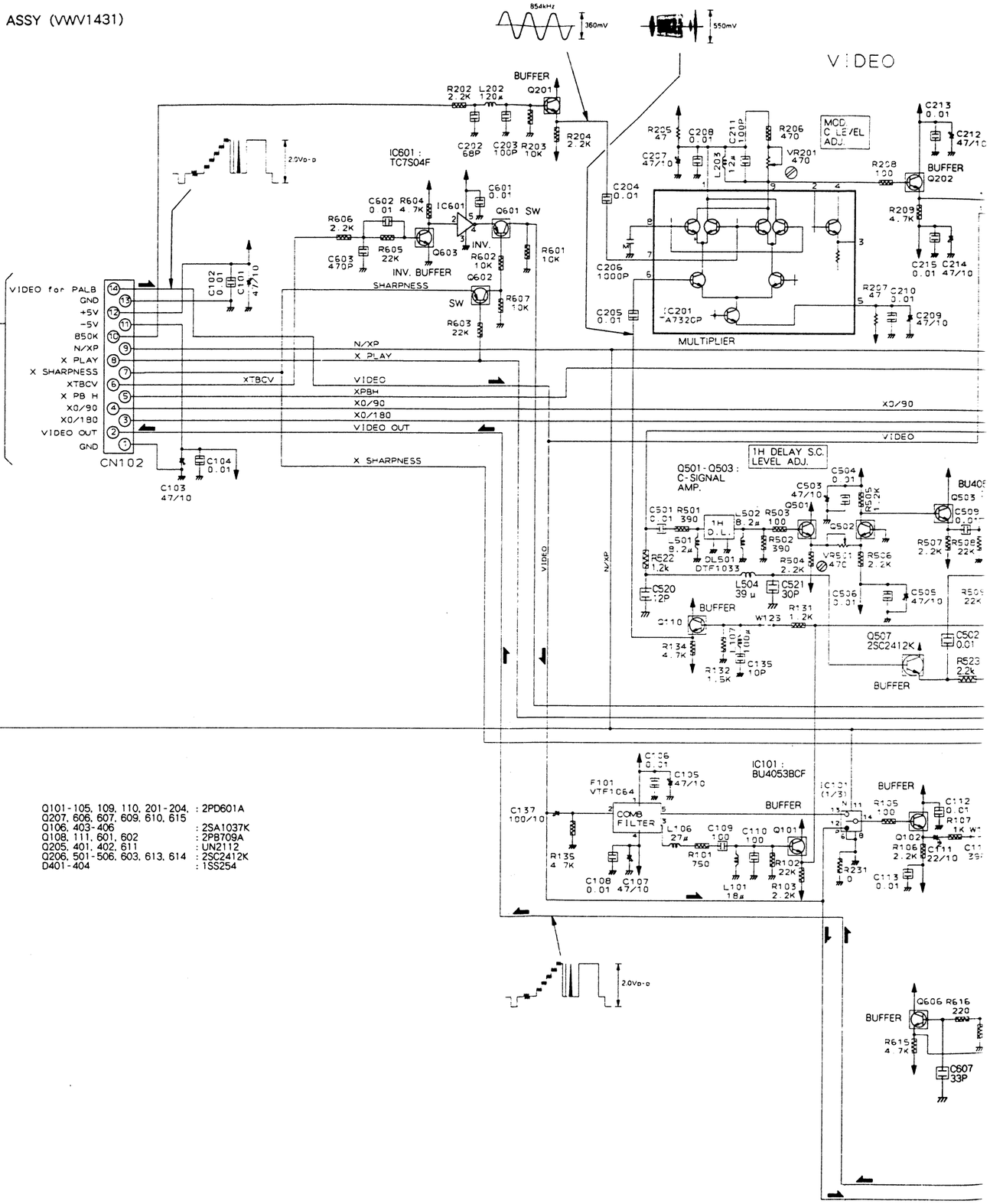
- This diagram is viewed from the mounted parts side.
- The parts mounted on this PCB include all necessary parts for several destinations. For further information for respective destinations, be sure to check with the schematic diagram.

3.5 PALB ASSY

PALB ASSY (VWV1431)

ANALOG AUDIO





Q101-105, 109, 110, 201-204, 207, 606, 607, 609, 610, 615 : 2PD601A
Q106, 403-406 : 2SA1037K
Q108, 111, 601, 602 : 2PB709A
Q205, 401, 402, 611 : UN2112
Q206, 501-506, 603, 613, 614 : 2SC2412K
D401-404 : 1SS254

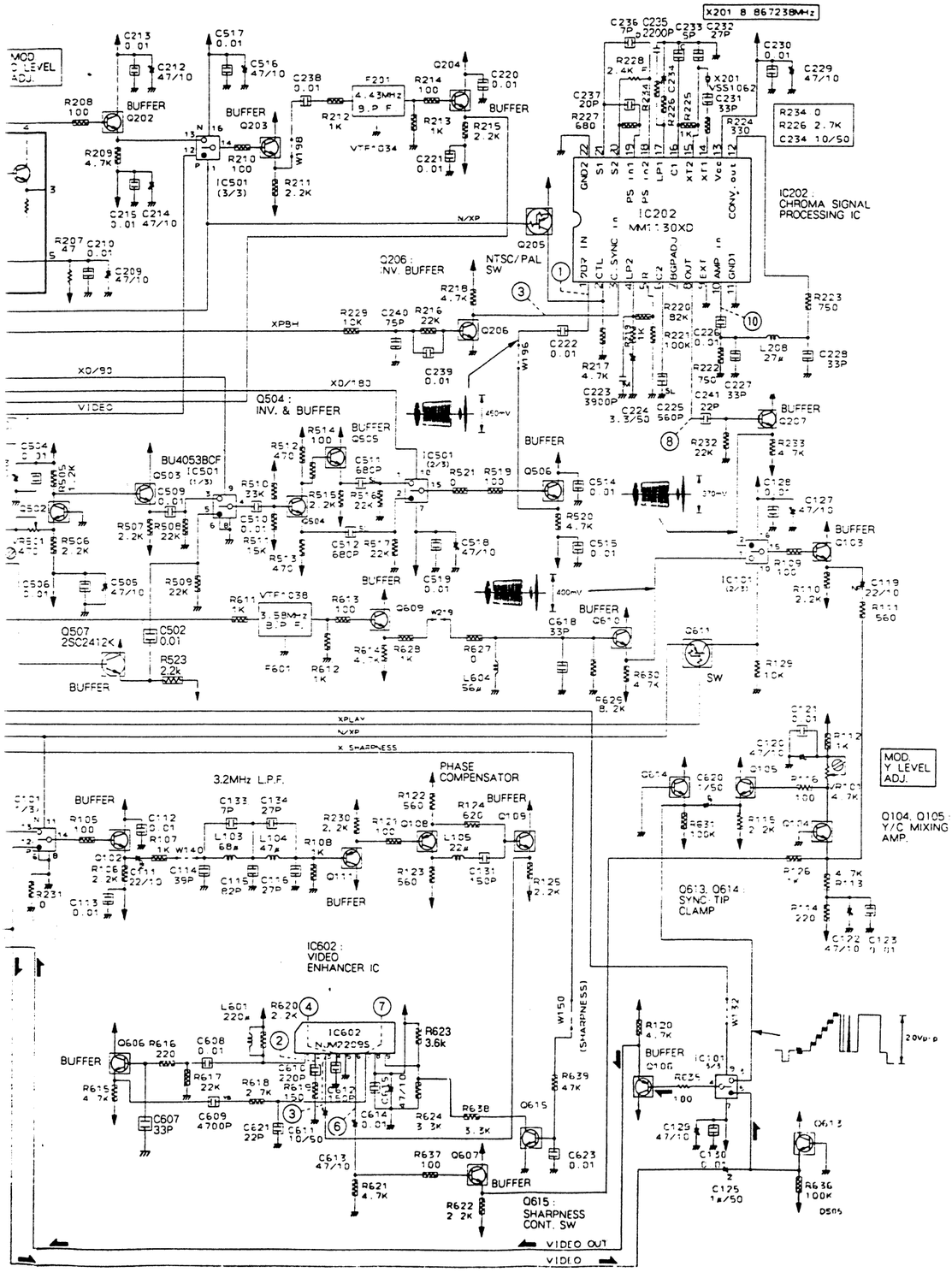
PALB ASSY

SCH-5

: RF SIGNAL LINE
: VIDEO SIGNAL LINE
: ANALOG AUDIO SIGNAL LINE

SCH - 5

VIDEO



PALB ASSY

SCH-5

WAVEFORMS AND VOLTAGE

VIDEO SECTION

Note : (No.) in the table correspond to the pin number.

IC400 (PAC005B)

(10) 1.52Vp-p, 0.55V — V : 20mV/Div, H : 10mS/Div

(8) (TOP) 2.4V, 1.85V — (11) (BOTTOM) 0.55V

(12) 1Vp-p, 1.65V — V : 20mV/Div, H : 10mS/Div

(14) 1Vp-p — V : 20mV/Div, H : 10mS/Div

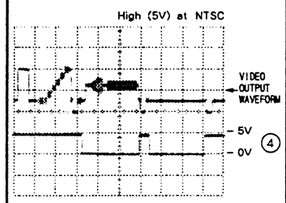
(22) (No noise)

(25) (with limiter noise) — V : 20mV/Div, H : 10mS/Div, approx. 330mVp-p

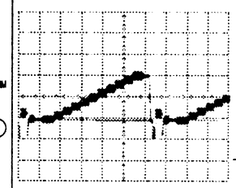
(27) approx. 1Vp-p — 0.5mS/Div

IC500 (PD6159A)

(4) XTBCV (at PAL) V : 0.5V/Div H : 20μS/Div

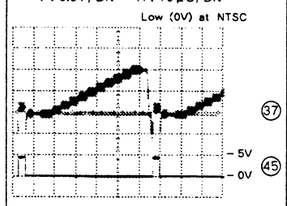


(37) ADIN (at PAL) V : 0.5V/Div H : 10μS/Div

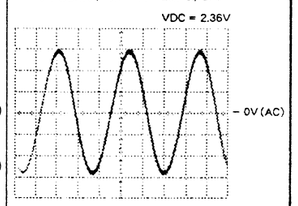


(58) DC02 (60) DC05 (61) DC07 V : 0.5V/Div H : 50nS/Div

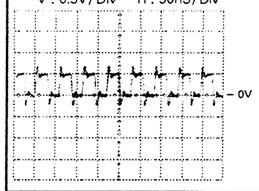
(37) ADIN (at PAL)
(45) PBCLP (PILOT BURST CLAMP PULSE) V : 0.5V/Div H : 10μS/Div



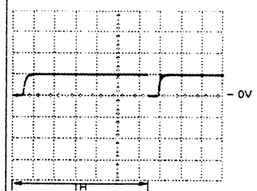
(64) AD CKP (at PAL) (15.0MHz)
(65) AD CKIN (at NTSC) (14.31818MHz) V : 50mV/Div H : 20nS/Div



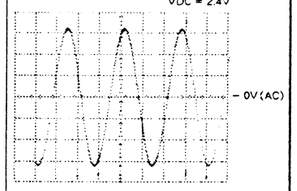
(22) RCK/XRCK (at NTSC BLUE BACK and PLAY) 4fsc = 14.31818MHz
RCK/XRCK (at PAL BLUE BACK) 4fsc = 17.734475MHz V : 0.5V/Div H : 50nS/Div



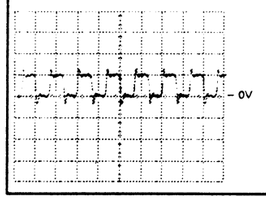
(41) XPB CSY (X PLAY BACK COMPOSITE SYNC) V : 0.5V/Div H : 10μS/Div



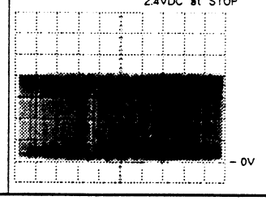
(70) DC01 (at PAL) (3.75MHz)
DC01 (at NTSC) (3.58MHz) V : 50mV/Div H : 0.1μS/Div



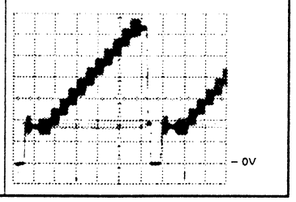
(22) RCK/XRCK (at PAL DISC PLAY) 4fp = 15.0MHz V : 0.5V/Div H : 50nS/Div



(44) RF (at PLAY) V : 0.1V/Div H : 5mS/Div



(79) VOUT (D/A OUT) V : 20mV/Div H : 10μS/Div



Pin	VDC (V)
35	2.40
38	1.475
40	0.55
75	2.5
77	2.5

4. PCB PARTS LIST

NOTES:

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex.1 When there are 2 effective digits(any digit apart from 0), such as 560 ohm and 47k ohm(tolerance is shown by J=5%, and K=10%).

560 Ω → 56 × 10¹ → 561 ····· RD1/8PM 5 6 1 J
47k Ω → 47 × 10³ → 473 ····· RD1/4PS 4 7 3 J
0.5 Ω → 0R5 ····· RN2H 0 R 5 K
1 Ω → 010 ····· RS1P 0 1 0 K

Ex.2 When there are 3 effective digits(such as in high precision metal film resistors).

5.62k Ω → 562 × 10¹ → 5621 ····· RN1/4PC 5 6 2 1 F

Mark	No.	Description	Part No.
LIST OF ASSEMBLIES			
NSP		MACB ASSY	VWM1535
NSP		├ PKSB ASSY	VWG1555
NSP		├ FG ASSY	VWG1556
NSP		├ TNSB ASSY	VWG1557
NSP		├ BISB ASSY	VWG1558
NSP		└ LMSB ASSY	VWG1612
NSP		FLKB ASSY	VWM1597
		├ FLKY ASSY	VWG1658
NSP		└ KEYB ASSY	VWG1659
		MOTHER ASSY	VWM1599
		├ MOTHER ASSY	VWS1197
NSP		└ SCRB ASSY	VWV1432
		PALB ASSY	VWV1431
⚠		SYPS ASSY	VWR1234
MACB ASSY			
OTHERS			
		PC board MACB	VNP1479
PKSB ASSY			
SWITCHES			
	S104, S105		DSG1017
FG ASSY			
SEMICONDUCTOR			
	D101		GP1S24

Mark	No.	Description	Part No.
TNSB ASSY			
SWITCH			
	S111		DSG1017
BISB ASSY			
SWITCH			
	S112		DSG1017
LMSB ASSY			
SWITCHES			
	S101-S103		DSG1017
OTHERS			
	CN101	12P FFC CONNECTOR	52044-1245
FLKB ASSY			
OTHERS			
		PC board FLKB	VNP1495
FLKY ASSY			
SEMICONDUCTORS			
	IC101		PD3312A
	IC102		S-806D
	Q106		DTA144EK
	Q105		DTC114EK
	Q101, Q103, Q104, Q107		UN2212
	D101, D103-D105		1SS353
	D106		1SS355
	D109		SLR-342MCT31
	D110		SLR-342VCT31
	D107		SLR-342YCT31

Mark	No.	Description	Part No.
SWITCHES			
	S101-S103		RSG1030
CAPACITORS			
	C104, C106		CEAL100M16
	C101		CEAL470M6R3
	C105		CKSQYF103Z50
	C102		CKSQYF104Z25
	C103, C121, C122		CKSQYF223Z50
RESISTORS			
	All Resistors		RS1/10S□□□J
OTHERS			
	CN102	FCC BOTTOM CONNECTOR 13P	52492-1320
	CN101	FCC BOTTOM CONNECTOR 16P	52492-1620
	X101	CERAMIC RESONATOR(9.0MHz)	EFOEC8004A4
		REMOTE SENSOR UNIT	GP1U58X
	V101	FL TUBE	VAW1035
		SPACER	VEC1599
		FL HOLDER	VNF1087
KEYB ASSY			
SEMICONDUCTORS			
	Q201-Q204		UN2212
	D203, D204		SLR-342MC3F
	D201, D202		SLR-342YC3F
SWITCHES			
	S201-S211		RSG1030
RESISTORS			
	All Resistors		RS1/10S□□□J
OTHERS			
	CN201	FCC BOTTOM CONNECTOR 13P	52492-1320
		PCB BINDER	VEF1040
MOTHER ASSY			
SEMICONDUCTORS			
	IC906		BA10393F
	IC202, IC903, IC905		BA4560F
	IC803		LA6510
	IC802		LC78681KE
	IC206		NJM78L08A
	IC207		NJM79L08A
	IC801		PAC002A
	IC901		PAC003A
	IC400		PAC005B
	IC101		PD0225A
	IC500		PD6159A
	IC501		PD9004A
	IC902		TA8410AK
	IC401, IC804		TC4W53F
	IC502		TC7SU04F

Mark	No.	Description	Part No.
	IC201		TC9400F
	Q102, Q410, Q504, Q916		2PB709A
	Q201, Q202, Q406, Q409, Q411		2PD601A
	Q805, Q840, Q903, Q904		2PD601A
	Q907, Q908, Q915, Q917		2PD601A
	Q404, Q407, Q408, Q412-Q414		2SA1037K
	Q503		2SA1037K
	Q834		2SA854S
	Q162		2SA933S
	Q512, Q513		2SC1740S
	Q402, Q405, Q505, Q510, Q511		2SC2412K
	Q803		2SC2412K
	Q152		2SC3802K
	Q204, Q205		2SD2144S
	Q208-Q212, Q514, Q515, Q918		UN2112
	Q103, Q161, Q206, Q207, Q901		UN2212
	Q910		UN2212
	D202		11EQS06
	D102, D162, D180, D205, D206		1SS254
	D401, D801, D901, D502, D905		1SS254
	D963		1SS254
	D171		1SS355
	D201		KV1851
	D161		MTZJ10B
	D110		MTZJ5.1B
COILS AND FILTERS			
	L510, L511		LAU101J
	L404, L405		LAU120J
	L401, L507		LAU121J
	L415		LAU180J
	L802-L804		LAU181J
	L408, L503, L504, L800, L801		LAU220J
	L403, L502		LAU270J
	L203		LAU2R2J
	L407, L411		LAU330J
	L414		LAU390J
	L406, L501		LAU430J
	L402		LAU470J
	L410		LAU560J
	L412		LAU8R2J
	L409		LFA561J
	F501		VTF1055
	F502		VTF1068
CAPACITORS			
	C556		CCSQCH040C50
	C507, C524, C552		CCSQCH050C50
	C466, C474, C475, C809, C811		CCSQCH070D50
	C159, C411, C414, C418, C431		CCSQCH100D50
	C454, C510, C534, C537, C545		CCSQCH100D50
	C567		CCSQCH100D50
	C412, C810, C846, C848, C891		CCSQCH101J50
	C944		CCSQCH101J50
	C472		CCSQCH120J50
	C413		CCSQCH121J50
	C517		CCSQCH150J50
	C161, C449, C812		CCSQCH151J50
	C248, C429		CCSQCH180J50
	C203, C538, C557, C813, C950		CCSQCH220J50
	C162, C448, C572, C577, C584		CCSQCH221J50

Mark	No.	Description	Part No.
	C935		CCSQCH221J50
	C415, C426, C428, C473, C506		CCSQCH270J50
	C536, C931		CCSQCH270J50
	C280, C281		CCSQCH271J50
	C106, C107, C427, C435, C459		CCSQCH330J50
	C511, C523, C551, C916		CCSQCH330J50
	C436		CCSQCH360J50
	C258-C263, C402, C535		CCSQCH390J50
	C232, C441		CCSQCH470J50
	C439, C446		CCSQCH560J50
	C403, C522, C806		CCSQCH680J50
	C814		CCSQCH820J50
	C440		CCSQCH910J50
	C836		CEAL470M6R3
	C838		CEALNP470M6R3
	C871		CEANP100M16
	C972		CEANP220M16
	C434		CEANP470M6R3
	C227, C286, C904		CEAS010M50
	C228, C444, C917		CEAS100M50
	C424, C543, C565		CEAS101M10
	C171, C274, C275, C465, C922		CEAS220M25
	C967, C968, C987		CEAS220M25
	C519, C532, C576, C974, C975		CEAS221M10
	C845, C902, C926		CEAS2R2M50
	C101, C207, C225, C226		CEAS470M10
	C270, C271, C422, C450, C458		CEAS470M10
	C508, C516, C527, C530, C542		CEAS470M10
	C547, C549, C553, C555, C558		CEAS470M10
	C562, C564, C569, C801, C803		CEAS470M10
	C833, C842, C844, C893, C927		CEAS470M10
	C933		CEAS470M10
	C210, C216		CEAS471M10
	C850, C870		CEAS4R7M50
	C913, C943		CEASR47M50
	C149, C150, C220-C224, C233		CKSQYB102K50
	C421, C525, C907, C914, C936		CKSQYB102K50
	C919		CKSQYB332K50
	C909		CKSQYB472K50
	C110, C122, C160, C196-C198		CKSQYF103Z50
	C201, C202, C205, C208, C211		CKSQYF103Z50
	C213, C407, C410, C419, C420		CKSQYF103Z50
	C432, C433, C437, C438, C445		CKSQYF103Z50
	C447, C457, C460, C463, C464		CKSQYF103Z50
	C509, C512-C514, C518		CKSQYF103Z50
	C520, C521, C526, C528, C529		CKSQYF103Z50
	C541, C544, C546, C548, C550		CKSQYF103Z50
	C559, C560, C566, C579-C583		CKSQYF103Z50
	C585, C586, C588, C802, C804		CKSQYF103Z50
	C807, C827, C828, C834, C835		CKSQYF103Z50
	C843, C872, C876, C888, C892		CKSQYF103Z50
	C894, C918, C928, C929, C932		CKSQYF103Z50
	C937-C939, C941, C961, C962		CKSQYF103Z50
	C964, C971, C982		CKSQYF103Z50
	C102, C103, C151, C209, C215		CKSQYF104Z25
	C284, C285, C423, C425, C443		CKSQYF104Z25
	C451, C461, C462, C468, C471		CKSQYF104Z25
	C505, C515, C533, C554, C561		CKSQYF104Z25
	C563, C568, C570, C571, C592		CKSQYF104Z25
	C831, C832, C840, C841, C847		CKSQYF104Z25
	C873, C874, C910-C912, C940		CKSQYF104Z25
	C981, C983		CKSQYF104Z25
	C837, C921, C930		CKSQYF223Z50
	C905, C951		CKSQYF224Z25
	C442, C808, C815, C875, C877		CKSQYF473Z25
	C924, C925		CKSQYF473Z25
	C942		CQMA103J50
	C920		CQMA104J50
	C455, C908		CQMA154J50
	C278, C282		CQMA182J50
	C903		CQMA222J50
	C960		CQMA224J50
	C934		CQMA681J50
	C456, C923		CQMA683J50
	VC501-VC503	(20pF)	VCM-008
RESISTORS			
	R220, R222	(4.7Ω, 1/6W)	DCN1001
	R414, R573		RD1/6PM470J
	R162		RD1/6PM471J
	R987, R989		RN1/10SE103D
	R986, R990		RN1/10SE333D
	R554		RN1/10SE391D
	R259-R262		RN1/10SE473D
	VR450	(2.2kΩ)	RCP1019
	VR603	(4.7kΩ)	RCP1020
	VR604, VR607, VR608, VR612	(47kΩ)	RCP1047
	Other Resistors		RS1/10S□□□J
OTHERS			
		4P CABLE HOLDER	51048-0400
	CN108	12P FFC CONNECTOR	52045-1245
	CN121	16P FFC CONNECTOR	52045-1645
	CN102	21P FFC CONNECTOR	52045-2145
	CN103	23P FFC CONNECTOR	52233-2310
	CN106	11P TOP POST	B11P-SHF-1AA
	CN206	KR CONNECTOR	**B6B-PH-K-S**
	CN207	B TO B CONNECTOR 12P	BTFN12S-3SB7
	CN208	B TO B CONNECTOR 14P	BTFN14S-3SB7
	JA3, JA4	REMOTE CONTROL JACK	RKN1004
		PCB BINDER	VEF1040
	JA6	2P PIN JACK	VKB1031
	JA1	1P PIN JACK	VKB1090
		SCREW TERMINAL	VNE1948
	KN101, KN102	EARTH PLATE	VNF1084
	X101	CERAMIC RESONATOR(9.0MHz)	VSS1040
	X502	CRYSTAL RESONATOR(17.734MHz)	VSS1059
	X501	CRYSTAL RESONATOR(14.318MHz)	VSS1073
	X503	CRYSTAL RESONATOR(15.0MHz)	VSS1079
	X201	CRYSTAL RESONATOR(16MHz)	VSS1081

CLD - D515

Mark	No.	Description	Part No.
SCRB ASSY			
CAPACITORS			
	C601, C602		CCSQCH271J50
	C607, C608		CKSQYB102K50
	C604		CKSQYF103Z50
	C603		CKSQYF104Z25
RESISTORS			
	All Resistors		RS1/10S□□□J
OTHERS			
	CN601	KR CONNECTOR	B6B-PH-K-S
		PCB BINDER	VEF1040
	JA16	RGB CONNECTOR	VKB1037
PALB ASSY			
SEMICONDUCTORS			
	IC101, IC501		BU4053BCF
	IC202		MM1130XD
	IC602		NJM2209S
	IC351		PA0061AM
	IC201		TA7320P
	IC601		TC7S04F
	Q108, Q111, Q601, Q602		2PB709A
	Q101-Q105, Q109, Q110		2PD601A
	Q201-Q204, Q207, Q606, Q607		2PD601A
	Q609, Q610, Q615		2PD601A
	Q106, Q403-Q406		2SA1037K
	Q206, Q501-Q507, Q603		2SC2412K
	Q613, Q614		2SC2412K
	Q205, Q401, Q402, Q611		UN2112
	D401-D404		1SS254
COILS AND FILTERS			
	L107		LAU101J
	L203		LAU120J
	L202		LAU121J
	L101		LAU180J
	L351		LAU181J
	L105, L352		LAU220J
	L601		LAU221J
	L106, L208		LAU270J
	L504		LAU390J
	L104		LAU470J
	L604		LAU560J
	L103		LAU680J
	L501, L502		LAU8R2J
	F201		VTF1034
	F401		VTF1035
	F402		VTF1036
	F601		VTF1038
	F101		VTF1064
CAPACITORS			
	C233		CCSQCH050C50
	C133, C236		CCSQCH070D50
	C135		CCSQCH100D50
	C109, C110, C203, C211, C370		CCSQCH101J50
	C520		CCSQCH120J50

Mark	No.	Description	Part No.
	C131, C353, C612		CCSQCH151J50
	C352		CCSQCH180J50
	C237		CCSQCH200J50
	C241, C621		CCSQCH220J50
	C610		CCSQCH221J50
	C116, C134, C232, C371		CCSQCH270J50
	C521		CCSQCH300J50
	C227, C228, C231, C354, C607		CCSQCH330J50
	C618		CCSQCH330J50
	C382		CCSQCH331J50
	C114, C351		CCSQCH390J50
	C383, C603		CCSQCH471J50
	C202, C375		CCSQCH680J50
	C240		CCSQCH750J50
	C115, C374		CCSQCH820J50
	C225		CCSQSL561J50
	C511, C512		CCSQSL681J50
	C125, C620		CEANP010M50
	C111, C119		CEANP220M10
	C234, C367, C611		CEAS100M50
	C137, C364		CEAS101M10
	C224		CEAS3R3M50
	C101, C103, C105, C107, C120		CEAS470M10
	C122, C127, C129, C207, C209		CEAS470M10
	C212, C214, C229, C363, C369		CEAS470M10
	C503, C505, C516, C518, C613		CEAS470M10
	C615		CEAS470M10
	C368		CEASR47M50
	C377		CKSQYB102K50
	C361, C362		CKSQYB392K50
	C355-C358, C609		CKSQYB472K50
	C102, C104, C106, C108		CKSQYF103Z50
	C112, C113, C121, C123, C128		CKSQYF103Z50
	C130, C204, C205, C208, C210		CKSQYF103Z50
	C213, C215, C220-C222, C226		CKSQYF103Z50
	C230, C238, C239, C372, C373		CKSQYF103Z50
	C376, C401-C404, C501, C502		CKSQYF103Z50
	C504, C506, C509, C510		CKSQYF103Z50
	C514, C515, C517, C519		CKSQYF103Z50
	C601, C602, C608, C614		CKSQYF103Z50
	C623		CKSQYF103Z50
	C365, C366		CKSQYF104Z25
	C359, C360		CKSQYF224Z25
	C206		CQMA102J50
	C235		CQMA222J50
	C223		CQMA392J50
RESISTORS			
	R635		RD1/6PM101J
	R205, R207		RD1/6PM470J
	R228		RN1/6PQ2401F
	VR101 (4.7kΩ)		RCP1020
	VR201, VR501 (470Ω)		RCP1120
	Other Resistors		RS1/10S□□□J

Mark	No.	Description	Part No.
OTHERS			
	CN101	B TO B CONNECTOR 12P	BTFN12P-3RD7
	CN102	B TO B CONNECTOR 14P	BTFN14P-3RD7
	DL501	64 USEC DELAY LINE	DTF1033
		SCREW TERMINAL	VNE1948
	X201	CRYSTAL RESONATOR (8.867238MHz)	VSS1062
SYPS ASSY			
SEMICONDUCTORS			
	IC20		HA17431P
⚠	IC2		ICP-N10
⚠	IC1		ICP-N20
	IC21		UPC358C
	Q27, Q30, Q32		2SA933S
⚠	Q20, Q22		2SB1566
⚠	Q24		2SB891F
	Q25, Q29, Q31		2SC1740S
⚠	Q2, Q3		2SC3377
⚠	Q21, Q23, Q26		2SD2395
⚠	Q1		2SK1460
⚠	D7		1SS270A
	D25-D27, D30, D31		AG01Z-VO
⚠	D1		D2SB60
⚠	D2		EG01C
⚠	D5		MTZJ3.6A
⚠	D29		MTZJ8.2B
⚠	D20		PS2561L1-1
⚠	D3		RD18FB2
⚠	D40		RD33FB2
⚠	D24		S2LA20
⚠	D21, D22		S3LA20
⚠	D23		S3S4M
RESISTORS			
⚠	R22-R25	(47Ω, 1/6W)	VCN1033
⚠	R27	(1Ω, 1/2W)	VCN1047
⚠	R31	(10Ω, 1/4W)	VCN1051
⚠	R29	(68Ω, 1/4W)	VCN1052
OTHERS			
⚠	F2	FUSE	VEK1033
⚠	F3, F4	FUSE	VEK1034
⚠	F5, F6	FUSE(1.0A/125V)	VEK1036
⚠	F1	FUSE(T1.6AH250V)	REK1033

5. SELF-DIAGNOSTIC FUNCTIONS

5.1 SELF-DIAGNOSTIC FUNCTIONS

The self-diagnostic functions automatically display an error code on the TV screen and front panel fluorescent display section when there is an error. The customer checks the error code and conveys it to the service personnel to make repairs more efficient.

After an error occurs, even if the error code goes off, you can display the error code again by holding down the CLEAR key for 10 seconds (except a loading error L ∗ display). At that time, partial error is displayed with the mechanism switch information. However, if the power cord is unplugged, the error code information is lost.

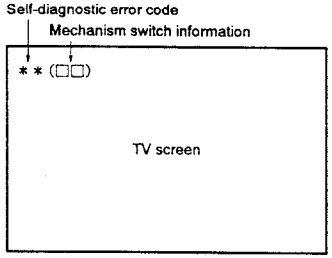


Fig. 1 TV screen display

This table explains the information for analyzing the cause when an error occurs with the CLD player.

Self-diagnostic error code	Contents	Conditions	Probable cause
H0	Spindle overcurrent detection error.	In the play state, overcurrent was detected in the spindle motor. Monitoring starts 5 seconds after the start of play or special playback mode, this error is detected if the overcurrent port is "L" for 4 seconds.	•Motor NG •Clamper rubbing
U0	FG abnormality error	①At LD start-up, the rate of rotation calculated from the FG was less than 15 rpm for 5 consecutive seconds from the spindle run command. ②At CD start-up, there was less than 1/8th rotation even after 5 seconds had passed since the end of acceleration. ③During play search, CD : subcordes are being read/LD : Phillips codes are being read and the spindle is locked, but a state in which the rate of rotation calculated from the FG was less than 15 rpm continued for 5 seconds or more. In the above case, it is judged that an abnormality has occurred in the FG sensor and that accurate rotation rate calculation has become impossible.	•FG sensor abnormality, FG signal not coming to mechanism controller •FG sensor clogged •Rubbing between FG sensor and slit •Turntable dropped •FG slit deposition NG
H1	Partial short error	①At LD start-up, the speed did not reach 1200 rpm within a certain time (12 seconds) after the spindle run command. ②At CD start-up, a certain speed (313 rpm) was not reached within 8 seconds from the end of spindle acceleration.	•Spindle motor NG •Commutator NG •Bearing too tight •Power supply NG
H2 A0	Power supply abnormality error	– 5V power supply abnormality detected. The power supply abnormality port is constantly monitored and if its signal stays high for about 1 second consecutively, the power supply is judged to be abnormal.	• – 5V not fed from SYPS assy •Parts shorted
L ∗	Loading error	①When loading operation goes over time (approx. 10 sec.). ②When assist at disc sense entry ends and is not tilt neutral. ③When assist at set up entry ends and is not tilt neutral.	•Tilt switch 1, 2, 3 abnormal, so tilt/loading state not read in correctly •Tilt/loading mechanism mechanically locked •Drive IC NG •Power supply NG
E ∗	Slider error	During slider movement, a time over-run occurred (track count search 20 seconds, mandatory movement 10 seconds)	•Slider ceased being able to run •The slider mechanism is mechanically locked and can no longer move to its target. •Slider position switch NG •Flexible cable pulled out •Drive IC NG •Power supply abnormal
U1	Miss clamp error	①During LD setup, after 1/8th rotation, the track count during 1/8 rotation exeeded 511. ②During start-up, the focus was lost once and refocusting was attempted, but the focus could not be locked. ③Two FG pulses did not come within 800 ms from from the start of LD start-up. ④The disc clamp operation did not end within 5 seconds.	•Disc sandwiched •Disc shifted •Spindle motor NG •Disc scratched or dirty defocused during start-up •Two discs loaded •PU actuator NG •Tilt sensor NG •Tilt neutral NG (tilt base NG)

Self-diagnostic error code	Contents	Conditions	Probable cause
P ∗	Spindle error	①During TOC reading with an LD, the spindle servo was not locked within 60 seconds from the start of the spindle run. ②When CAV/CLV determination is not finished within 60 seconds from spindle servo lock. ③The codes could not be read for 10 – 15 seconds consecutively for an LD or 7 – 10 seconds for a CD/CDV and the spindle servo was not locked. ④The speed exceeded 2100 rpm during LD start up.	P0: •PH code, SUB-Q code can not be read •VCO, PLL offset out of adjustment •Disc defect P5: •PAL disc, mirror disc, etc. PLAY •No RF P6: •Spindle servo does not lock •Spindle motor NG
F ∗	Focus error	①"In the "no disc" state, a setup command was received from the mode controller. ②When LD is out of focus when slider is moved to starting position during set up. In case of CD/CDV is NG even after three focus tries. ③During start-up, the maximum slider servo duty continued for 3 loops or more.	F5: •CD, LD on top of each other •LD scratched or dirty defocused during slider movement •Disc NG •Slider position switch NG F6: •Inner edge of disc scratched or dirty •Slider ran into inner edge mechanical stopper

∗ Besides the above errors, there is the "U2" communications error (the mode controller could not communicate normally with the mechanism controller)
The probable cause is a defective mechanism controller, disconnected cable, etc..

∗ Mechanism mode contents (meanig of ∗ for L ∗ etc.)

0 : Play
1 : Open
2 : Standby
3 : Clamp
4 : Disc sense
5 : Setup (rotation start)
6 : TOC read
7 : Play
8 : Search
9 : Side A → Side B
A : Side B → Side A

5.2 FORMAT OF THE MECHANISM SWITCH INFORMATION WHICH IS TRANSMITTED TO THE MODE CONTROL IN THE ERROR OCCURRENCE

Example
• **Mechanism switch information (1 7)**

Mechanism control → Mode control
Communication byte address 5 (COMBUF5)
(Mode control displays this value as it is.)

Example 1 / Example 7

Example

bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
0	0	0	1	0	1	1	1
TURN A	O Not used	LTSW1	LTSW2	LTSW3	SLDP1	SLDP2	SLDP3

TURNA	Slider position
0	Side B
1	Side A

Example of 1 7 is indicated as follows.

Slider : Side B
Tilt : Tilt +
Position : B-INSIDE

LTSW 1	2	3	Loading/tilt position
0	1	1	Open (Tray open state)
0	0	1	Loading (During move the tray horizontally)
1	0	1	Standby (Tray close & spindle down state)
1	0	0	Clamp (Durring spindle up or down)
0	0	0	Tilt – (Clamp state)
0	1	0	Tilt + (Clamp state)
1	1	0	Tilt limit (Clamp state)

SLDP 1	2	3	Slider position
1	0	0	CD active position
1	0	1	CDV active position
1	1	0	LD active position
0	1	1	CD inside position
1	1	1	Side B inside position

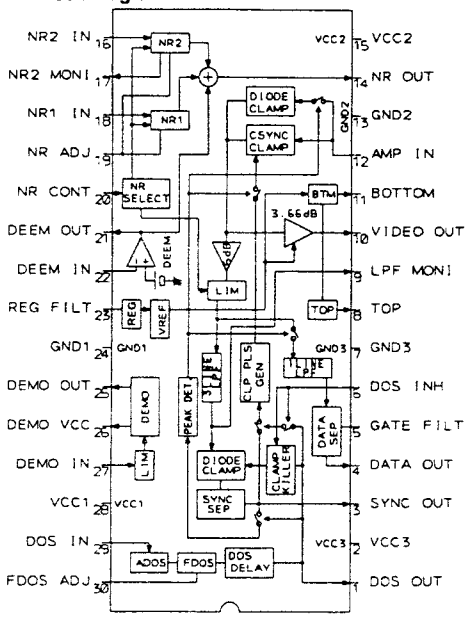
6. IC INFORMATION

- The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

■ PAC005B (MOTHER ASSY : IC400)

• VIDEO IC

• Block Diagram



• Pin Function

No.	Pin Name	Function
1	DOS OUT	Drop out pulse output.
2	VCC3	VCC for SYNC SEP section.
3	SYNC OUT	Composite sync output.
4	DATA OUT	Data pulse output.
5	GATE FILT	Connect a capacitor for Date - Gate.
6	DOS INH	Clamp pulse and clamp killer control.
7	GND3	GND for SYNC SEP section.
8	TOP	Reference DC (TOP) for A/D.
9	LPF MONI	Monitor the LPF for SYNC SEP.
10	VIDEO OUT	Signal output for A/D.
11	BOTTOM	Reference DC (BOTTOM) for A/D.
12	AMP IN	Sync chip clamp input.
13	GND2	GND for VIDEO.
14	NR OUT	Noise reduction output.
15	VCC2	VCC for VIDEO section.
16	NR2 IN	Signal input (2) for noise reduction.
17	NR2 MONI	Limitter output for noise reduction.
18	NR1 IN	Signal input (1) for noise reduction.
19	NR ADJ	Limitter level adjusting pin for noise reduction.
20	NR CONT	Noise reduction (1, 2) select and limitter control.
21	DEEM OUT	De-emphasis output.
22	DEEM IN	De-emphasis input.
23	REG FILT	Connect a capacitor for regulator.
24	GND1	GND for RF section.
25	DEMO OUT	Demodulation output of RF signal.
26	DEMO VCC	VCC for FM demodulation output.
27	DEMO IN	RF input for FM demodulation.
28	VCC1	VCC for RF section.
29	DOS IN	RF input for DOS.
30	FDOS ADJ	FDOS sensitivity adjustment.

■ PD6159A (MOTHER ASSY : IC500)

• DUAL DIGITAL VIDEO PROCESSOR IC

• Descriptions

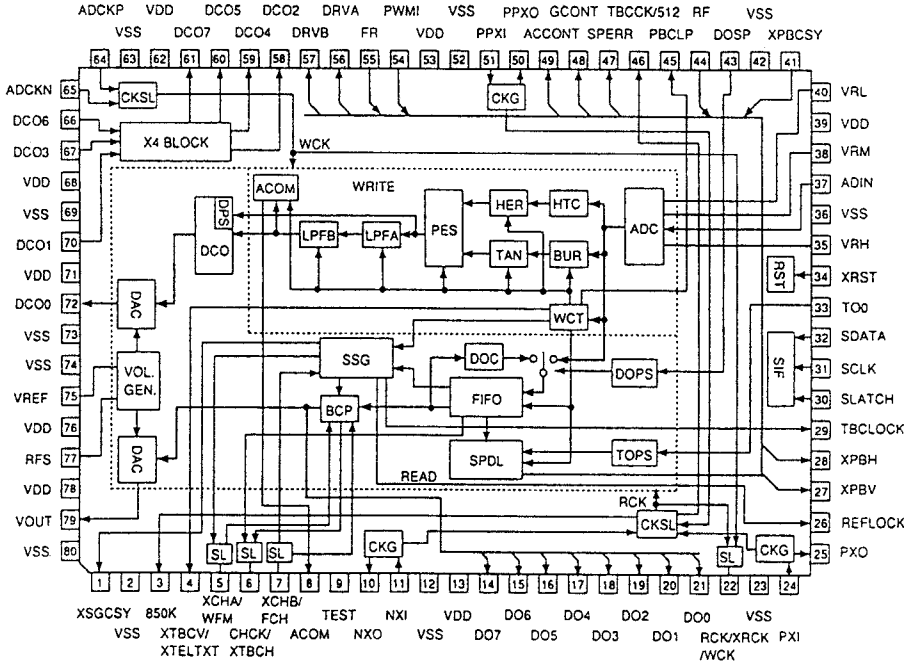
The PD6159A is a digital video signal processor (DVP) IC designed for dual-CLD players. It supplies time-base-corrected (TBC) video signals (conforming to both PAL and NTSC formats), which have a jitter right after the RF demodulation. It also generates sync signals which synchronize with these output video signals. In addition, various signals required for spindle control are generated by the IC. The PD6159A features the following.

The main functions are compatible with those of the PD0146A (NTSC-exclusive DVP).

Clocks NTSC : 4 fsc
PAL : 4 fp (4x pilot burst for disc video)
4 fsc (for squelch)

Digital TBC
Sync signal generation and synchronization
Generation of a signal for spindle control
Dropout compensation NTSC : Color
PAL : Monochrome
Character-superimpose function
Blue-background generation

• Block Diagram



CLD - D515

• Pin Function

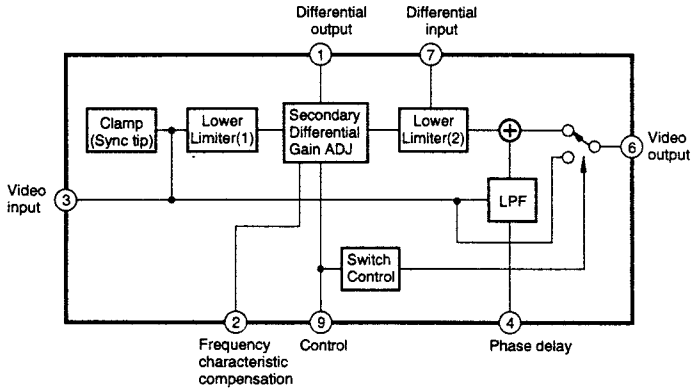
No.	Pin Name	I/O	Function	
1	XSGCSY	O	Outputs the reference composite sync from SG with negative logic. While normally in synchronization with the output video signal, it can be specified for free run in memory system mode. (Always synchronized in squelch mode) It can also be delayed by a command with a specified delay duration (SYD0-5).	
2	VSS	–	To be connected to GND. (VSS associated with the logic)	
3	850K	O	Output obtained by exclusive-ORing the NTSC fsc wave with the PAL fsc wave. After passing through an external filter, it can be used as an 850-kHz wave required for NTSC-to-PAL conversion.	
4	XTBCV	O	TELSEL=0	Outputs time-base-corrected V sync with negative logic. In PAL, the timing of the rising can be set to the ends of 23H and 336H by a command (XTBCVSEL).
	XTELTXT	O	TELSEL=1 & NTSC/XPAL=0	Outputs "L" to indicate the teletext data positions (video portion at 20H, 21H, 333H, 334H) in PAL. Fixed to "H" in NTSC.
5	XCHA	I	XCGEN=0	To be connected to the character output of the OSD IC when using the character-superimpose function. When "L" the white level is imposed to the video output.
	WFM	O	XCGEN=1	Outputs "H" for the first field and "L" for the second field.
6	CHCK	O	XCGEN=0	Outputs 2-fsc (2-fp) waves for the OSD IC when using the character-superimpose function. It is synchronized with the RCK/XRCK output.
	XTBCH	O	XCGEN=1	Outputs the time-base-corrected H sync with negative logic.
7	XCHB	I	XCGEN=0	Accepts the character-frame output of the OSD IC when using the character(-frame)-superimpose function. When the input to this pin is "L" and to XCHA is "H" the gray level is imposed on the video output.
	FCH	I	XCGEN=1 & MEMSYS=1	Accepts the field-change signal from the memory controller in memory system mode. "H" at 268H in NTSC or "H" at 315H in PAL during the second field switches the second field to the first field. To be fixed to "L" when not used.
8	ACOM	O	Outputs a signal representing the duty, which depends on the error level obtained at the internal phase comparator. To be used for audio jitter compensation.	
9	TEST	I	To be used when testing the IC. Fix it to "L".	
10	NXO	O	To be connected to the NTSC 4-fsc crystal oscillator.	
11	NXI	I	To be connected to the NTSC 4-fsc crystal oscillator.	
12	VSS	–	To be connected to GND. (VSS associated with the logic)	
13	VDD	–	To be connected to +5 V. (VDD associated with the logic)	
14	DO7	O	To be used normally when OE=1 and OSD0/OSD01=0. A time-base-corrected digital video signal is obtained here in memory mode. DO0 yields the LSB and DO7 the MSB. The signal is in synchronization with the RCK/XRCK output. The squelch data will be output in squelch mode. The data to be output can be selected by commands OSD0/OSD1. When OE=0, these pins are fixed to "L".	
15	DO6			
16	DO5			
17	DO4			
18	DO3			
19	DO2			
20	DO1			
21	DO0			
22	RCK/XRCK	O	OTHERS	Outputs the reference clock (4 fsc for NTSC, 4 fp for PAL video, or 4 fsc for PAL squelch). Positive or negative phase can be selected by a command (RCKSEL).
	WCK	O	OE=1 & OSD=1	Outputs the write clock (4 fsc for NTSC or 4fp for PAL).
23	VSS	–	To be connected to GND. (VSS associated with the logic)	
24	PXI	I	To be connected to the PAL 4-fsc crystal oscillator.	
25	PXO	O	To be connected to the PAL 4-fsc crystal oscillator.	
26	REFLOCK	O	Outputs "H" when the phase difference of H/V sync associated with PB (after TBC) and those associated with SSG is small enough.	
27	XPBV	O	Outputs the signal obtained by separating V sync from the signal at XPBCSY (pin 41) with negative logic.	
28	XPBH	O	Outputs the signal obtained by separating H sync from the signal at XPBCSY (pin 41) with negative logic.	
29	TBCLOCK	O	Outputs "H" when the spindle loop and the TBS loop are locked.	
30	SLATCH	I	Gives the latch timing for data applied to the serial interface. (Through at the rising and no change in register contents during L/H periods and at the falling.)	
31	SCLK	I	Clock inputs for the serial interface. The SDATA value will be read at the rising edge.	
32	SDATA	I	Provides the serial interface with data.	
33	TO0	I	Accepts a tracking-open pulse. The pulse will be internally stretched. The stretch volume is set by a command (STD0 to STD3).	
34	XRST	I	Input for initializing the IC. When "L" all the registers and counters of the IC are set to their initial values.	
35	VRH	I	Provides the AC converter with the reference voltage of the H side.	
36	VSS	–	To be connected to GND. (VSS for the AD converter)	
37	ADIN	I	Input for the AD converter. Accepts a composite video signal having a jitter. In PAL, the pilot burst wave must be in a range of the half the difference between the H reference voltage and the L reference voltage. (See the example of input specifications.)	
38	VRM	I	Intertap pin between the reference resistors. A bypass capacitor can be connected for stabilization.	

No.	Pin Name	I/O	Function
39	VDD	–	To be connected to +5 V. (VDD for the AD converter)
40	VRL	I	Provides the AD converter with the reference voltage for the L side.
41	XPBCSY	I	The PB composite sync is to be supplied here with negative logic.
42	VSS	–	To be connected to GND. (VSS associated with the logic)
43	DOSP	I	Accepts the dropout detection pulse. The pulse will be internally stretched. The stretch volume is set by a command (STD0-3).
44	RF	I	Accepts an RF signal for the spindle servo.
45	PBCLP	O	Flag output to indicate the positions for level clamp of the pilot-burst signal in PAL. (See the example of input specifications.)
46	TBCCK/512	O	Outputs a 1/512th division (approx. 28 kHz) of the clock (NTSC: 4 fsc, PAL: 4 fp) used for TBC. It is used to generate a chopping wave for spindle control.
47	SPERR	O	Output pin for a phase-frequency error of the spindle errors. It outputs the result of comparison between PBH and reference H in tristate. The polarity can be set by a command (PERPOL).
48	GCONT	O	Outputs a PWM signal according to the command-specified value (CD0-3).
49	ACCONT	O	Tristate output of the acceleration/deceleration signal, which depends either on the forced acceleration/deceleration signal, the error detection by RF or error detection by H sync. The acceleration/deceleration volume is determined by setting the duty of the PWM output by commands (RFGD0-3, HFGD0-3). The polarity can be set by a command (ACCPOL).
50	PPXO	O	To be connected to the PAL 4-fp crystal oscillator.
51	PPXI	I	To be connected to the PAL 4-fp crystal oscillator.
52	VSS	–	To be connected to GND. (VSS associated with the logic)
53	VDD	–	To be connected to +5 V. (VDD associated with the logic)
54	PWMI	I	Accepts a signal obtained through the voltage comparison between the spindle error which has passed through a loop filter and the chopping wave externally generated from TBCCK/512.
55	FR	I	Accepts a signal obtained through the voltage comparison between the spindle error which has passed through a loop filter and the destination voltage.
56	DRVA	O	Control signal output for Tr which drives the spindle motor. It is applicable to either a brush motor or brushless motor, selection of which is by a command (BLM). (See the functional block diagram for the logic.)
57	DRVB	O	
58	DCO2	O	Outputs a signal obtained through waveformshaping of the DCO1 signal.
59	DCO4	O	Outputs a signal obtained through waveformshaping of the DCO3 signal.
60	DCO5	O	Outputs a signal multiplied by 2.
61	DCO7	O	Outputs a signal multiplied by 4, which is used as the write clock after passing through a 4-fp or 4-fsc filter.
62	VDD	–	To be connected to +5 V. (VDD for output multiplied by 4).
63	VSS	–	To be connected to GND. (VSS for output multiplied by 4).
64	ADCKP	I	Write clock input for PAL. Accepts the DCO7 output via a 4-fp filter.
65	ADCKN	I	Write clock input for NTSC. Accepts the DCO7 output via a 4-fsc filter.
66	DCO6	I	Accepts a signal obtained by delaying the DCO5 signal by approx. 35 ns.
67	DCO3	I	Accepts a signal obtained by delaying the DCO2 signal by approx. 70 ns.
68	VDD	–	To be connected to +5 V. (VDD for input multiplied by 4).
69	VSS	–	To be connected to GND. (VSS for input multiplied by 4).
70	DCO1	I	Accepts the DCO0 signal via a low-pass filter.
71	VDD	–	To be connected to +5 V. (VDD for the DA converter for DCO0 output).
72	DCO0	O	DC0 output. The signal here is multiplied by 4 to produce ADCK. It can be fixed to the minimum potential by a command (DCOINH).
73	VSS	–	To be connected to GND. (VSS for the DA converter for DCO0 output).
74	VSS	–	To be connected to GND. (VSS for the internal power source for the DA converter).
75	VREF	I	Input to show the reference voltage to the internal power source for the DA converter.
76	VDD	–	To be connected to +5 V. (VDD for the internal power source for the DA converter).
77	RFS	IO	Pin to specify the internal current of the internal power source for the DA converter. Connect 5.1 kohms as standard between this pin and GND.
78	VDD	–	To be connected to +5 V. (VDD for the DA converter for VOUT output).
79	VOUT	O	Time-base-corrected video output. While a composite sync is normally inserted, the sync position will be found at the pedestal level in memory system mode. (However, some half-H pulses etc. may partly remain near V sync.)
80	VSS	–	To be connected to GND. (VSS for the DA converter for VOUT output)

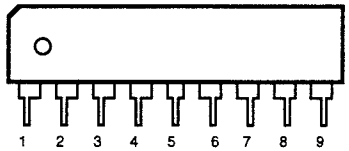
■NJM2209S (PALB ASSY:IC602)

• VIDEO ENHANCER

• Block Diagram



• Pin Assignment



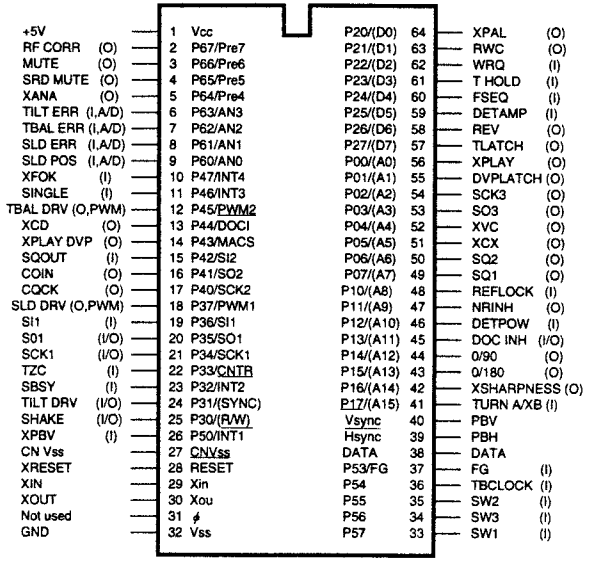
• Pin Function

No.	Function
1	Differential output (open-collector)
2	Frequency characteristic compensation
3	Video input
4	Phase delay
5	GND
6	Video output
7	Differential input
8	V+ (5V)
9	Control input (open and not used)

■PD0225A (MOTHER ASSY : IC101)

• MECHANISM CONTROL IC

• Pin Assignment (Top view)



• Pin Function

No.	Pin name	I/O	Function
1	Vcc	I	Power supply connection pin. 5V±10% applied.
2	RF CORR	O	RF correction switch signal output pin. "H" =Gain up "H" =Rise up CAV, within #8000 at TOC reading. "L" =others (#8000 - #8100 : hold the previous state.)
3	MUTE	O	Audio system audio mute control signal output pin. "H" =Mute ON, "L" =Mute OFF
4	SRDMUTE	O	AC3 mute control signal output pin. Release mute only during play. "L" =Mute, "H" =Release mute
5	XANA	O	Digital/Analog audio switching signal output pin. "H" =Digital, "L" =Analog
6	TILT ERR	I A/D	Tilt sensor output signal input pin. The tilt motor is controlled to make this signal 2.5V.
7	TBAL ERR	I A/D	Tracking balance error signal input pin(A/D input port). This signal is converted from analog to digital and used for tracking offset control input.
8	SLD ERR	I A/D	Slider error signal input pin (A/D input port). This signal is converted from analog to digital and used for slider servo control input.
9	SLD POS	I A/D	Pickup position detection switch input pin (A/D input port). The switches are resistance divided, the A/D input value read in, and the position detected.
10	XFOK	I	Focus servo lock signal input pin. "L" =lock, "H" =unlock Used for focus servo lock detection.
11	SINGLE	I	Uses the rear panel ATT switch in single mode and communicates this data to the mode controller. "L" =normal, "H" =single
12	TBAL DRV	O PWM	Tracking offset control signal output pin. PWM outputs the tracking offset for use as the auto tracking offset. Period 910 μsec, 3-value control : H, L, Z
13	XCD	O	LD/CD switching signal output pin.
14	XPLAY DVP	O	Spindle servo signal output pin. "L" =during servo, "H" =acceleration, brake, during servo
15	SQOUT	I	DSP reading command data input pin. SUBQ is read out.
16	COIN	O	DSP writing command data output pin.
17	CQCK	O	DSP read/write command clock output pin. Read in at rising edge.
18	SLD DRV	O PWM	Slider control signal output pin. Side A : 5V=FWD, 0V=REV, Side B : 0V=FWD, 5V=REV, 2.5V=STOP, Period 910 μ sec, 3-value control : H, L, Z

No.	Pin name	I/O	Function
19	SI1	I	Data input pin from mode controller IC.
20	SO1	O	Serial data output pin to mode controller IC.
21	SCK1	I/O	Clock for serial communication with mode controller IC. Other than when communicating with mode controller IC, input mode.
22	TZC	I	Tracking error zero cross signal input pin. Control the slider motor which is counted this signal in the track count search.
23	SBSY	I	Subcode block sync. signal input pin. "H" =S0, S1, "L" =others
24	TILT DRV	I/O	Load/tilt control output pin. 0.5V - tray in, out/tilt down, up 2.5V - stop Use for tilt servo by PWM output the tilt drive.
25	SHAKE	I/O	Handshake signal pin for data communications with mode controller IC. This pin is a bidirectional data line and control the input/output by the respective microcomputers.
26	XPBV	I	LD/CDV playback vertical sync signal input pin. "L" =during vertical sync.
27	CN Vss	I	Ground for A/D conversion.
28	XRESET	I	Reset signal input pin. "L" =reset, "H" =release reset Controlled by mode controller IC.
29	XIN	I	9MHz clock oscillation input pin.
30	XOUT	O	9MHz clock oscillation output pin.
31	N.C.	O	Dedicated output pin, so other uses prohibited.
32	Vss	I	Ground
33	SW1	I	Switch input pin for loading/tilt position detection.
34	SW3	I	Switch input pin for loading/tilt position detection.
35	SW2	I	Switch input pin for loading/tilt position detection.
36	TBCLOCK	I	Spindle lock signal input pin. "H" =Lock, "L" =Unlock
37	FG	I	Spindle motor FG signal input pin. 16 pulses per rotation, used within microcomputer frequency divided by 2.
38	DATA	I	Mechanism controller built-in Phillips code/decode input pin.
39	XPBH	I	Playback HSYNC input for Phillips coding/decoding.
40	XPBV	I	Playback VSYNC input for Phillips coding/decoding.
41	TURN A/XB	I	Double sided mech. turn switch. "H" =side A, "L" =side B
42	XSHARPNESS	O	High quality circuit (analog NR) control signal output pin. "H" =through the HQ circuit, "L" =Not through
43	0/180	O	Phase switch signal output pin at PAL trick play. "H" =through the inverter, "L" =through
44	0/90	O	Phase switch signal output pin at PAL trick play. "H" =through the 1H delay line, "L" =through
45	DOC INH	I/O	Control the clamp pulse and clamp killer circuits by 3-value.
46	DETPOW	I	Used as power supply abnormality signal input port. "L" =normal, "H" =abnormal
47	NRINH	O	VDEM noise reduction control output pin. "L" =normal, "H" =no NR
48	REFLOCK	I	Reference signal input pin from DVP. "L" =phase not aligned, "H" =phase aligned
49	SQ1	O	Analog audio switching signal output pin. 1/L squelch : H
50	SQ2	O	Analog audio switching signal output pin. 2/R squelch : H
51	XCX	O	Analog audio CX noise reduction switching signal output pin. "L" =ON, "H" =OFF
52	XVC	O	Voice cancel output. "L" =cancel, "H" =OFF
53	SO3	O	Serial 3 data signal output pin. The serial signals are common and are distinguished with the latch signals (XLAT3, XLAT2 and T LATCH).
54	SCK3	O	Serial 3 clock signal output pin. Reading at rising edge. "H" period : 2 μsec "L" period : 20 μsec
55	DVPLATCH	O	PD6159 serial latch signal output pin. Latches at falling edge.
56	XPLAY	O	In the PAL trick play, video path switching signal output pin at quasi-PAL. "H" =through the PAL special playback circuit. "L" =not through
57	T LATCH	O	Latch signal output pin of serial control for DAC & digital filter IC PD2026A. Latches at falling edge.
58	REV	O	Pickup tension signal output pin at reverse. "H" =side B, "L" =side A
59	DETAMP	I	Spindle overcurrent detection signal input pin. "L" =overcurrent, "H" =normal
60	FSEQ	I	Subcode sync match detection signal input pin. "H" =matches, "L" =does not match
61	T HOLD	I	Track jump accelerating/decelerating signal input pin. "H" =during accelerating/decelerating, "L" =neither
62	WRQ	I	Subcode Q read OK signal input pin. "L" =NG, "H" =This pin goes high when the subcode Q data passes the CRC check.
63	RWC	O	DSP read/write command signal output pin. "L" =read, "H" =write
64	XPAL	O	PAL/NTSC switching signal output pin. "H" =NTSC, "L" =PAL

■PD3312A (FLKY ASSY : IC101)

• MODE CONTROL IC

• Pin Function

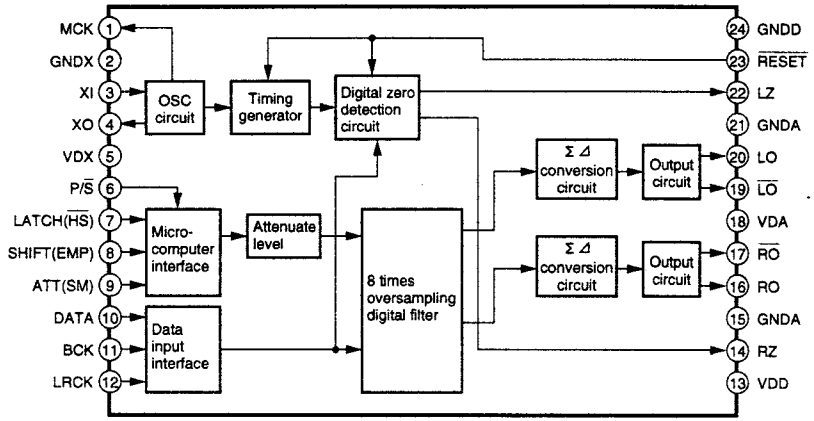
Note : H : HIGH level , L : LOW level , — : High impedance, P : Pulse

No.	Pin name	I/O	Function	No.	Pin name	I/O	Function
1	Vcc	—	+5V power supply.	33	XMIC ON	O	Not used.
2	XRESET	O	MOTHER ASSY reset output.	34	n	O	Display segment output.
3	XSCK	I/O	Serial communication clock. (mechanism control and character generator)	35	KS4/m	O	Key scan output/Display segment output.
4	S MTOF	I	Serial communication data input. (mechanism control)	36	KS3/l	O	Key scan output/Display segment output.
5	S FTOM	O	Serial communication data output. (mechanism control and character generator)	37	KS2/k		
6	XCS	O	Character generator (PD9004A) chip select output. (L : enable)	38	KS1/j		
7	LED FLF	O	Display off LED output.	39	KS0/i		
8	LED THT	O	Theater mode LED output.	40	h	O	Display segment output.
9	POWER ON	O	Power supply switching output of the MOTHER ASSY.	41	g		
10	AVcc	—	+5V power supply.	42	f		
11	KIN0	I	Key data input.	43	e		
12	KIN1			44	d		
13	KIN2			45	c		
14	KIN3			46	b		
15	SECAM	I	Trident TV correspondence. H : correspond, L : not correspond	47	a		
16	SW1	I	H : PAL model, L : DUAL model	48	Vdisp	—	Power supply for VFD (-29V) .
17	SW2	I	PAL AFM H : present, L : absent	49	G8	O	Display gnd output.
18	SW3	I	PAL trick play H : present, L : absent	50	G7		
19	AVss	—	+5V power supply.	51	G6		
20	TEST	I	Connect to GND. (not used)	52	G5		
21	X1	I	NC (not used)	53	G4		
22	X2	I	Connect to +5V. (not used)	54	G3		
23	Vss	—	GND	55	G2		
24	OSC1	I	System clock oscillator connection pin.	56	G1		
25	OSC2	O		57	LED_LD	O	LD tray open/close LED output.
26	XRESET	I	CPU reset (L : reset)	58	LED_CD	O	CD tray open/close LED output.
27	SHAKE	I/O	Mechanism control serial communication requirement.	59	LED_A	O	Side A LED output.
28	SEL IR	I	Remote control input.	60	LED-B	O	Side B LED output.
29	FSX	I	7.35MHz frame sync. signal of EFM decoder.	61	NC	O	NC
30	EFLG	I	Error correction state signal of EFM decoder.	62	NC	O	NC
31	GND	—	Ground	63	NC	O	NC
32	WDF	O	For WATCHDOG pulse output.	64	NC	O	NC

■TC9400F (MOTHER ASSY:IC201)

• D/A CONVERTER

• Block Diagram



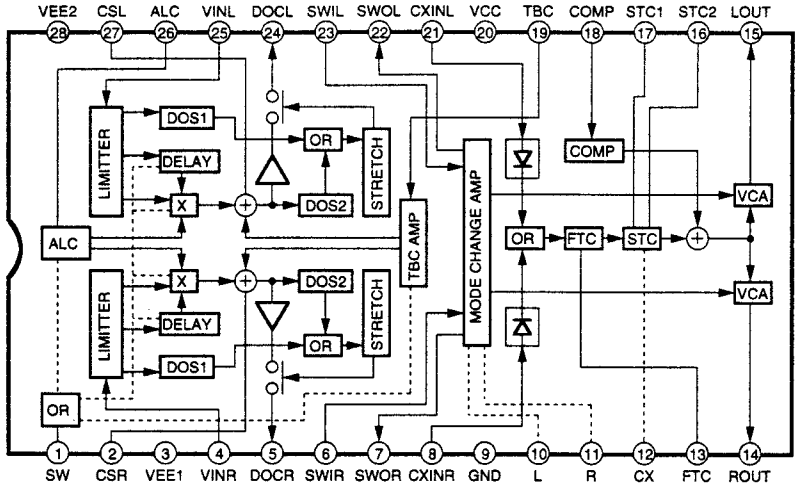
• Pin Function

No.	Pin name	I/O	Function
1	MCK	O	System clock supply pin.
2	GNDX	—	Ground pin of oscillation section.
3	XI	I	Crystal oscillator connection pin. Generates a clock for system.
4	XO	O	
5	VDX	—	Power supply pin for oscillation section.
6	P/S	I	Parallel/serial control switching pin. (Schmitt input and pull-up resistor)
7	LATCH (HS)	I	In the serial control, data latch signal input pin for attenuator. In the parallel control, normal/double speed mode selection pin. (Schmitt input and pull-up resistor)
8	SHIFT (EMP)	I	In the serial control, shift clock input pin for attenuator. In the parallel control, deemphasis filter ON/OFF control pin. (Schmitt input and pull-up resistor)
9	ATT (SM)	I	In the serial control, data I input pin for attenuator. In the parallel control, soft mute control pin. (Schmitt input and pull-up resistor)
10	DATA	I	Data input pin. (Schmitt input)
11	BCK	I	Bit clock input pin. (Schmitt input)
12	LRCK	I	LR clock input pin. (Schmitt input)
13	VDD	—	Power supply pin for digital section.
14	RZ	O	R-ch digital zero detection output pin.
15	GNDA	—	Ground pin for R-ch analog section.
16	RO	O	R-ch data positive-phase output pin.
17	RO	O	R-ch data negative-phase output pin.
18	VDA	—	Power supply pin for analog section.
19	LO	O	L-ch data negative-phase output pin.
20	LO	O	L-ch data positive-phase output pin.
21	GNDA	—	Ground pin for L-ch analog section.
22	LZ	O	L-ch digital zero detection output pin.

■PA0061AM (PALB ASSY:IC351)

• A. AUDIO DEMODULATION

• Block Diagram



• Pin Function

No.	Pin name	Function
1	SW	PAL/NTSC switch pin.
2	CSR	Capacitor connection pin for eliminating carrier.
3	VEE1	Power supply pin.
4	VINR	FM signal input pin.
5	DOCR	Drop out correction switch output pin.
6	SWIR	Mode switch amp input pin.
7	SWOR	Mode switch amp output pin.
8	CXINR	CX control signal input pin.
9	GND	Ground.
10	L	Mode switch pin L.
11	R	Mode switch pin R.
12	CX	CX ON-OFF switch pin.
13	FTC	Capacitor connection pin for FTC.
14	ROUT	R ch output pin.
15	LOUT	L ch output pin.
16	STC2	STC pin 2.
17	STC1	STC pin 1.
18	COMP	Compensator pin.
19	TBC	TBC error signal input pin.
20	VCC	Power supply pin.
21	CXINL	CX control signal input pin.
22	SWOL	Mode switch amp output pin.
23	SWIL	Mode switch amp input pin.
24	DOCL	Drop out correction switch output pin.
25	VINL	FM signal input pin.
26	ALC	Capacitor connection pin for ALC.
27	CSL	Capacitor connection pin for eliminating carrier.
28	VEE2	Power supply pin.

• Truth Table of Mode Switch

MODE	SW (pin1)
PAL	Low (0V)
NTSC	High (5V)

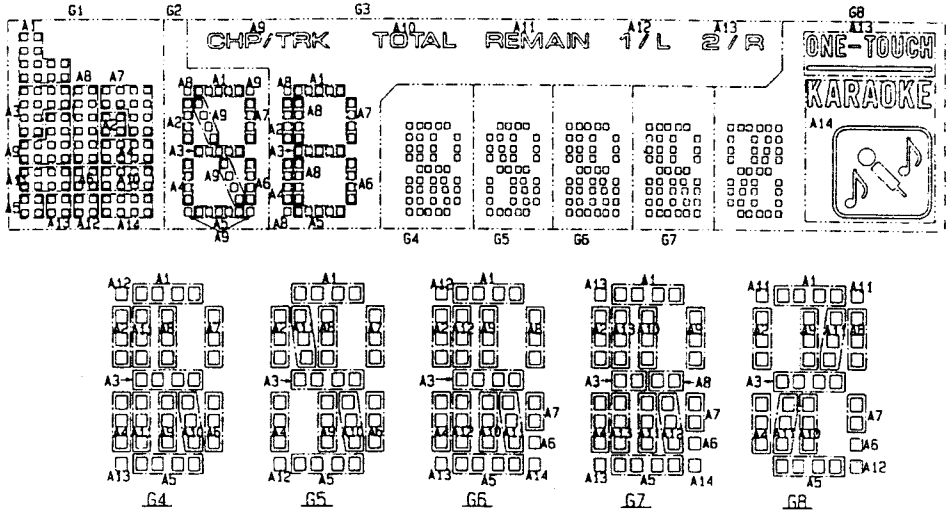
MODE	L (pin 10)	R (pin 11)
STEREO	Low (0V)	Low (0V)
MONO (L)	Low (0V)	High (5V)
MONO (R)	High (5V)	Low (0V)
SQUELCH	High (5V)	High (5V)

MODE	CX (pin 12)
CX ON	Low (0V)
CX OFF	High (5V)

7. FL INFORMATION

■ VAW1035 (FLKY ASSY : V101)

FL TUBE



ANODE GRID ASSIGNMENT & PIN ASSIGNMENT

	G1	G2	G3	G4	G5	G6	G7	G8
P1	A1	A1	A1	A1	A1	A1	A1	A1
P2	A2	A2	A2	A2	A2	A2	A2	A2
P3	A3	A3	A3	A3	A3	A3	A3	A3
P4	A4	A4	A4	A4	A4	A4	A4	A4
P5	A5	A5	A5	A5	A5	A5	A5	A5
P6	A6	A6	A6	A6	A6	A6	A6	A6
P7	A7	A7	A7	A7	A7	A7	A7	A7
P8	A8	A8	A8	A8	A8	A8	A8	A8
P9	A9	A9	CHP/TRK	A9	A9	A9	A9	A9
P10	A10		TOTAL	A10	A10	A10	A10	A10
P11	A11		REMAIN	A11	A11	A11	A11	A11
P12	A12		1/L	A12	A12	A12	A12	A12
P13	A13		2/R	A13		A13	A13	ONE-TOUCH
P14	A14					A14	A14	KARAOKE

PIN ASSIGNMENT

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Assignment	F	F	NP	NL	NL	NL	NL	G1	G2	G3	G4	G5	G6	G7	G8	P1	P2

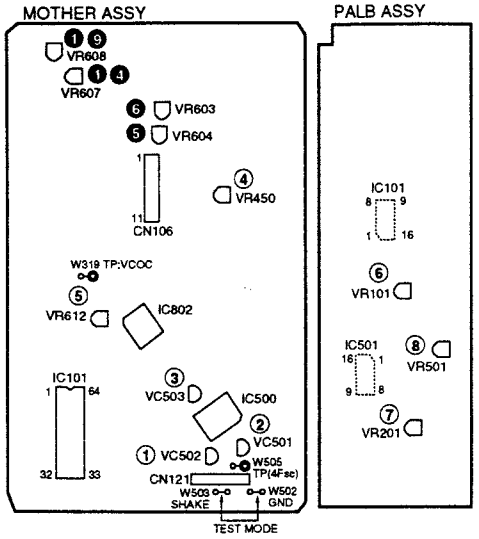
Pin No.	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
Assignment	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	NL	NL	NP	F	F

F:Filament G1~G8:Grid P1~P14:Anode NP:No pin NL:No Lead

8. ADJUSTMENTS

8.1 ADJUSTMENT ITEMS AND LOCATION

■Adjustment Points (PCB Part)



■Adjustment Items

[Mechanical Part]

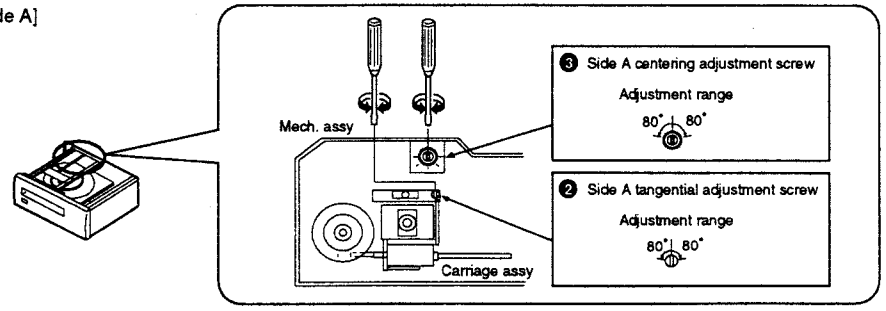
❶ Tilt Offset Adjustment
❷ Tangential Direction Angle Adjustment for Side A
❸ Spindle Motor Centering Adjustment for Side A
❹ Crosstalk Check and Fine Tilt Offset Adjustment for Side A
❺ Focus Servo Loop Gain Adjustment
❻ Tracking Servo Loop Gain Adjustment
❼ Tangential Direction Angle Adjustment for Side B
❽ Spindle Motor Centering Adjustment for Side B
❾ Crosstalk Check and Fine Tilt Offset Adjustment for Side B

[Electrical Part]

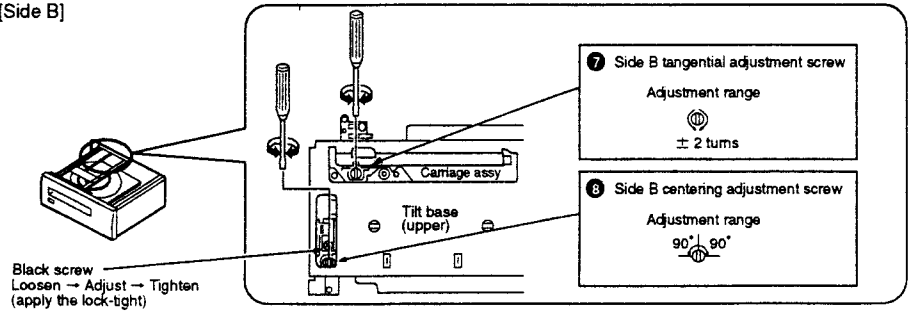
① PAL Master Clock Adjustment
② NTSC Master Clock Adjustment
③ PAL Master Clock Adjustment
④ Output Video Level Adjustment
⑤ PLL Offset Adjustment
⑥ Modulation Y Level Adjustment
⑦ Modulation C Level Adjustment
⑧ 1H Delay S.C. Level Adjustment

■Adjustment Points (Mechanism Part)

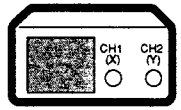
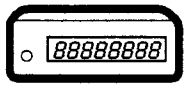
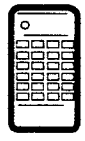
[Side A]



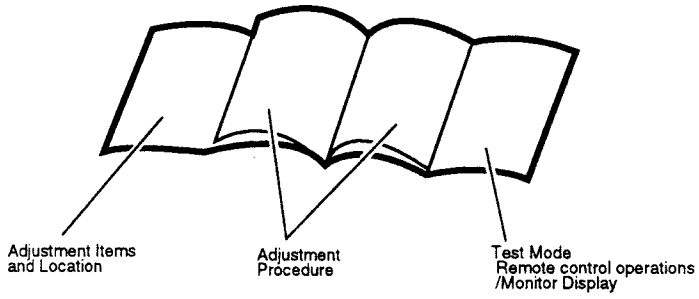
[Side B]



8.2 JIGS AND MEASURING INSTRUMENTS

CD test disc (YEDS-7)	LD test disc NTSC disc (GGV1012) PAL disc (GGV1007)	⊖ Screwdriver (medium)	⊖ Screwdriver (small)
⊖ Precise screwdriver	⊕ Screwdriver (large)	⊕ Screwdriver (medium)	 Dual-trace oscilloscope (with delay) Frequency band ≧ 40MHz
 Frequency counter Display digit ≧ 8-digit	TV monitor	 Test mode remote control unit (GGF1067)	

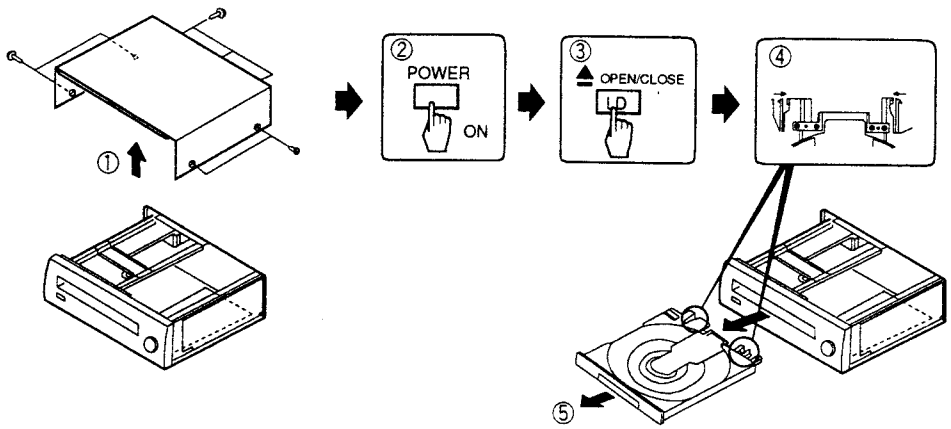
• Use this manual as follows:



8.3 DISASSEMBLY/ASSEMBLY

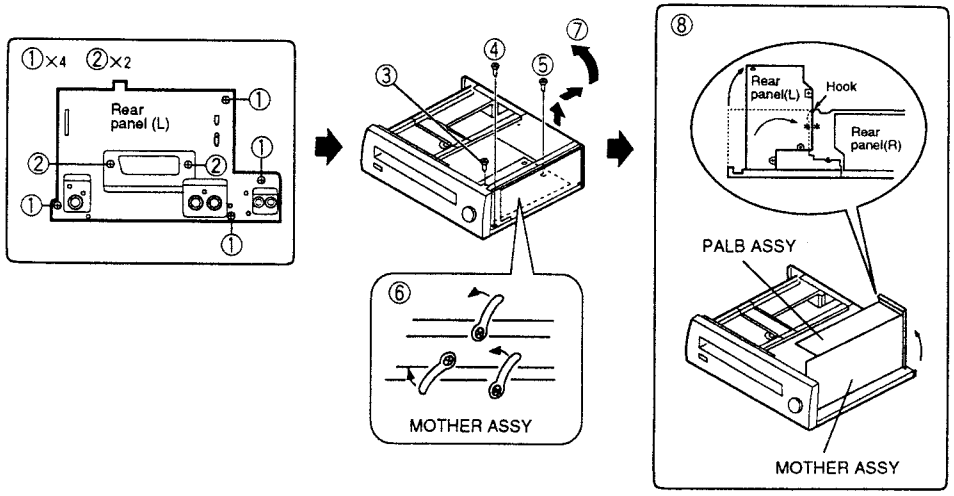
(1) Disc Tray

- Disassembly : ①→②→③→④→⑤
- Assembly : ⑤→①



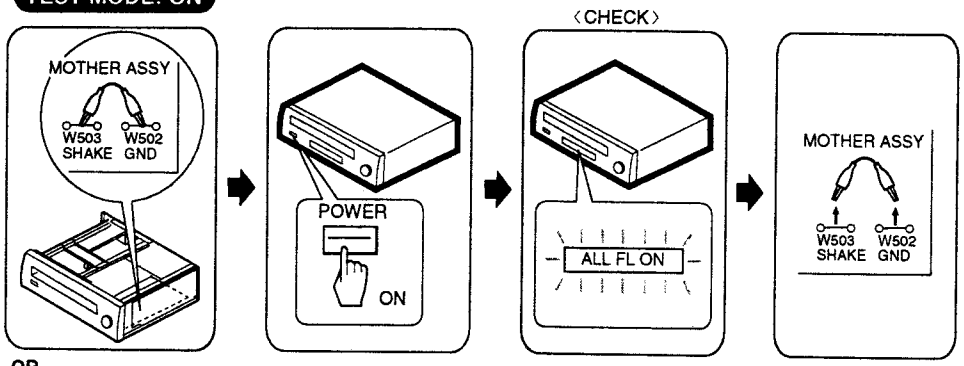
(2) MOTHER ASSY

- Disassembly : ①→②→③→④→⑤→⑥→⑦→⑧
- Assembly : ⑧→⑦→⑤→⑤→④→③→②→①

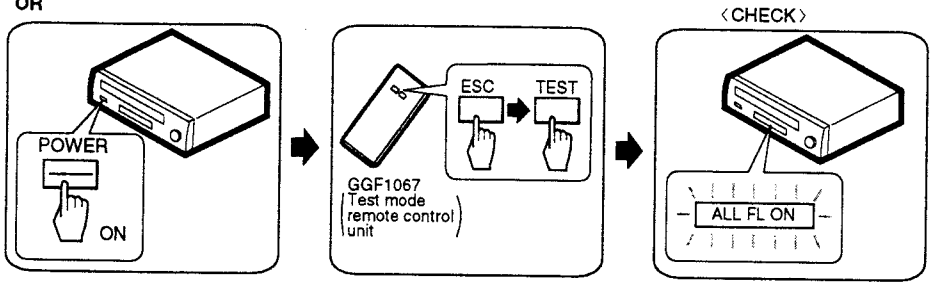


8.4 TEST MODE

TEST MODE: ON

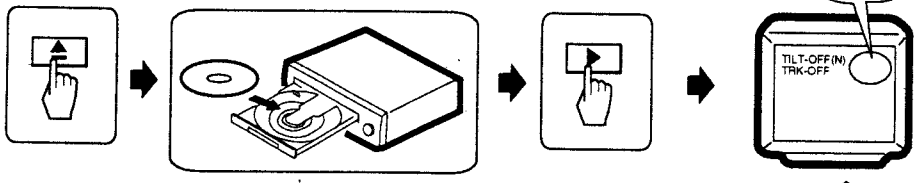


OR

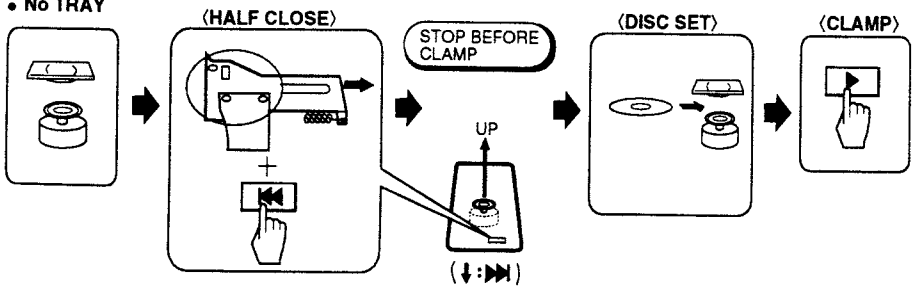


TEST MODE: DISC SET

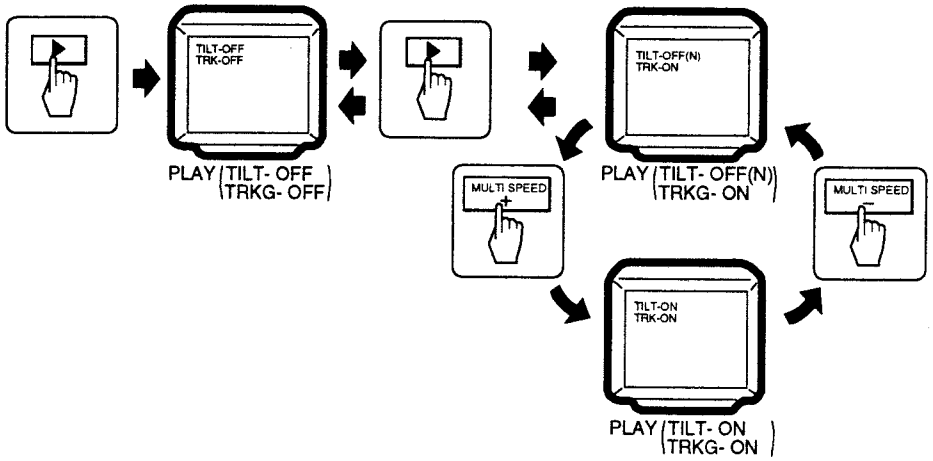
• With TRAY



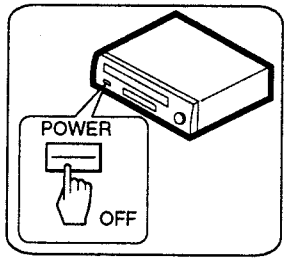
• No TRAY



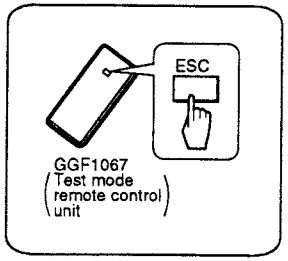
TEST MODE: PLAY



TEST MODE: OFF



OR

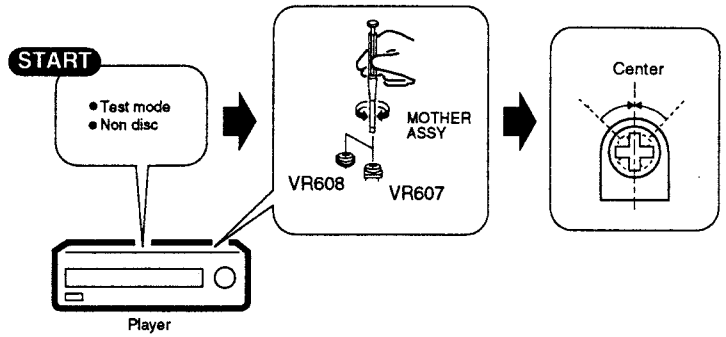


8.5 NECESSARY ADJUSTMENT POINTS

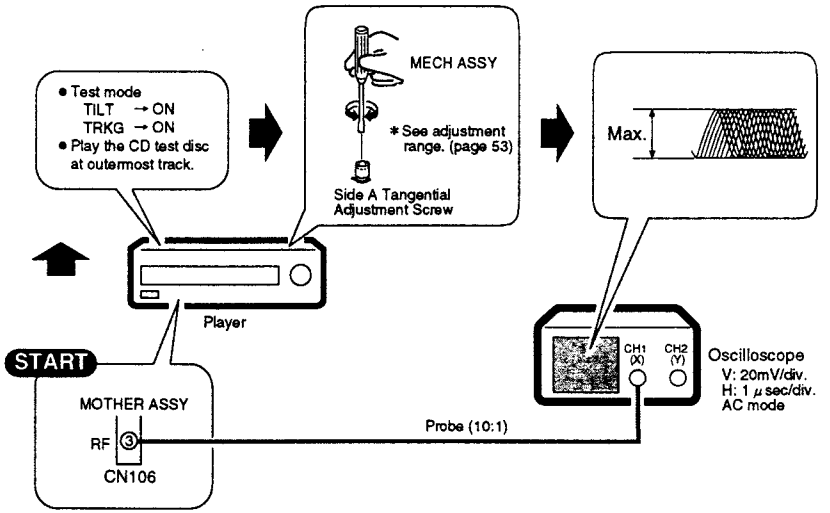
When		Adjustment Points
Exchange pickup	Mechanical system	❶,❷,❸,❹,❺,❻,❼,❽,❾
	Electric system	———
Exchange spindle motor	Mechanical system	❸,❹
	Electric system	⑤
Exchange board MOTHER ASSY	Mechanical system	❶,❹,❺,❻,❾
	Electric system	①,②,③,④,⑤,⑥
Exchange board PALB ASSY	Mechanical system	———
	Electric system	⑥,⑦,⑧
Track Skip	Mechanical system	❸,❺,❻
	Electric system	⑤
Slow Search Slow Start	Mechanical system	❸,❺,❻
	Electric system	———
	Mechanical system	
	Electric system	

8.6 MECHANICAL ADJUSTMENT

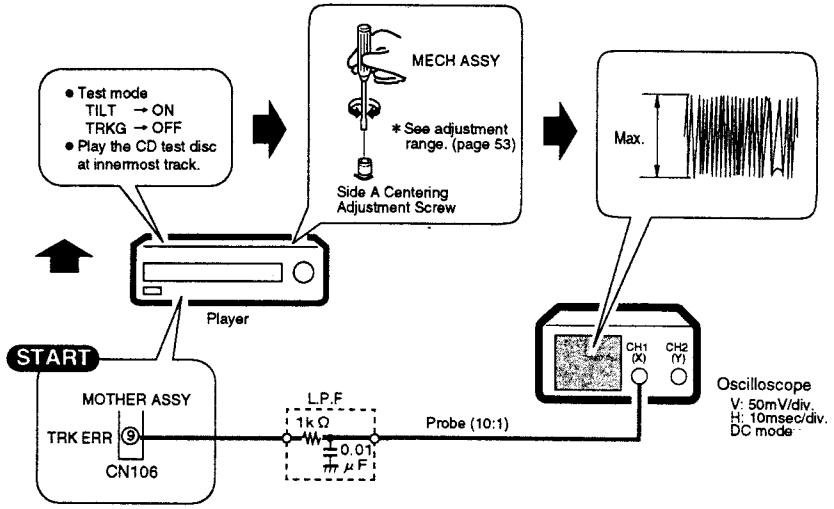
❶ Tilt Offset Adjustment



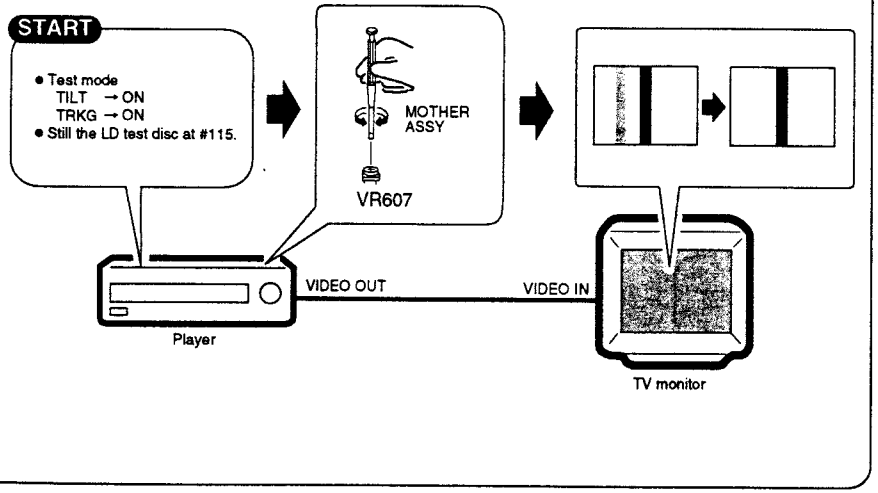
❷ Tangential Direction Angle Adjustment for Side A



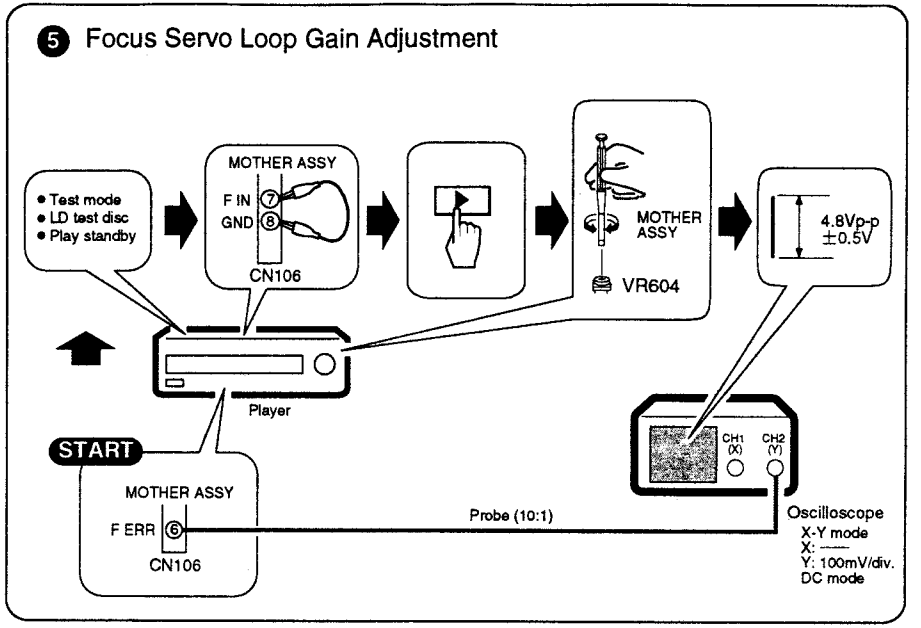
3 Spindle Motor Centering Adjustment for Side A



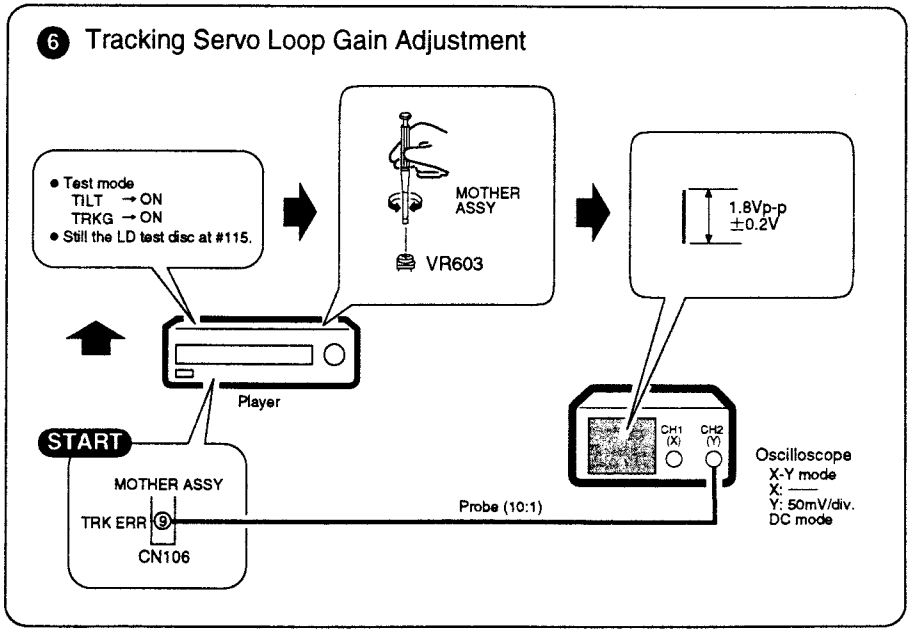
4 Crosstalk Check and Fine Tilt Offset Adjustment for Side A



5 Focus Servo Loop Gain Adjustment

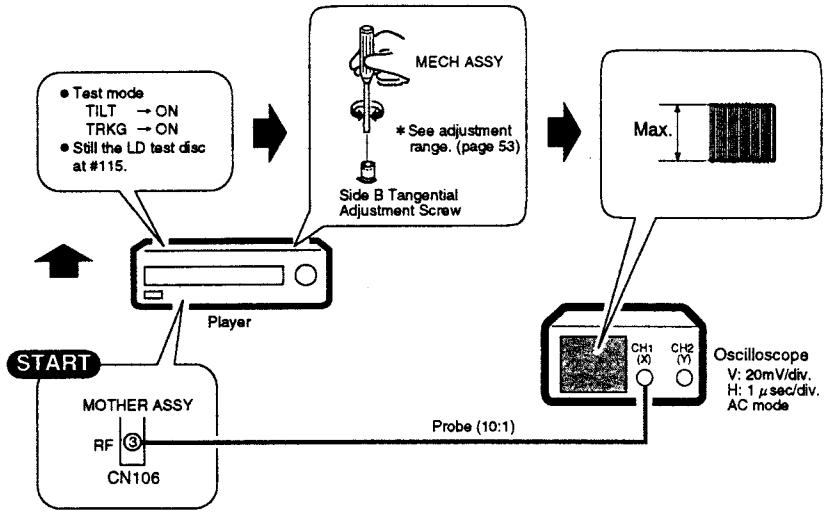


6 Tracking Servo Loop Gain Adjustment

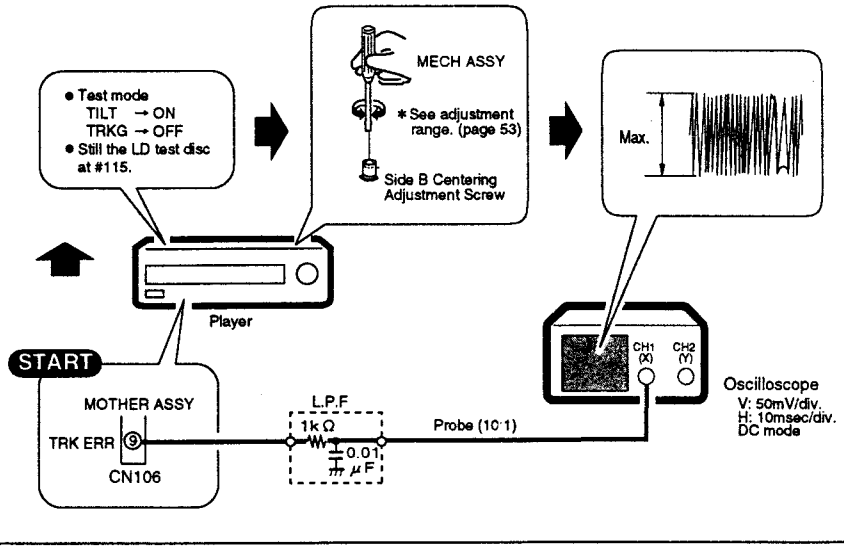


CLD - D515

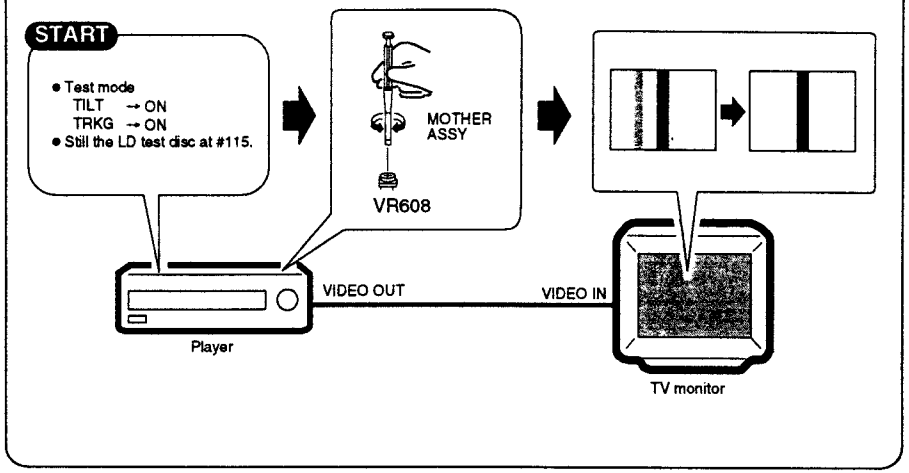
7 Tangential Direction Angle Adjustment for Side B



8 Spindle Motor Centering Adjustment for Side B



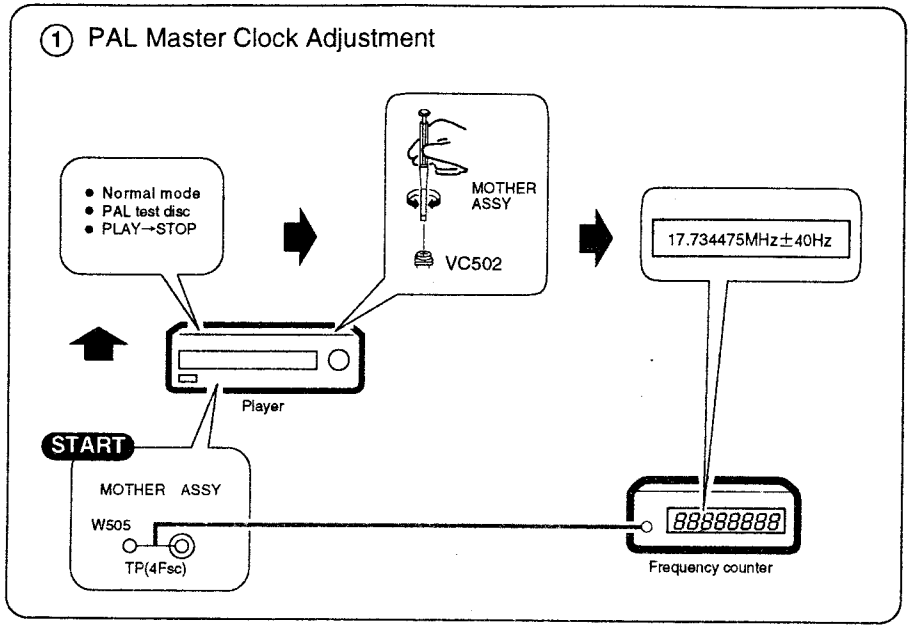
9 Crosstalk Check and Fine Tilt Offset Adjustment for Side B



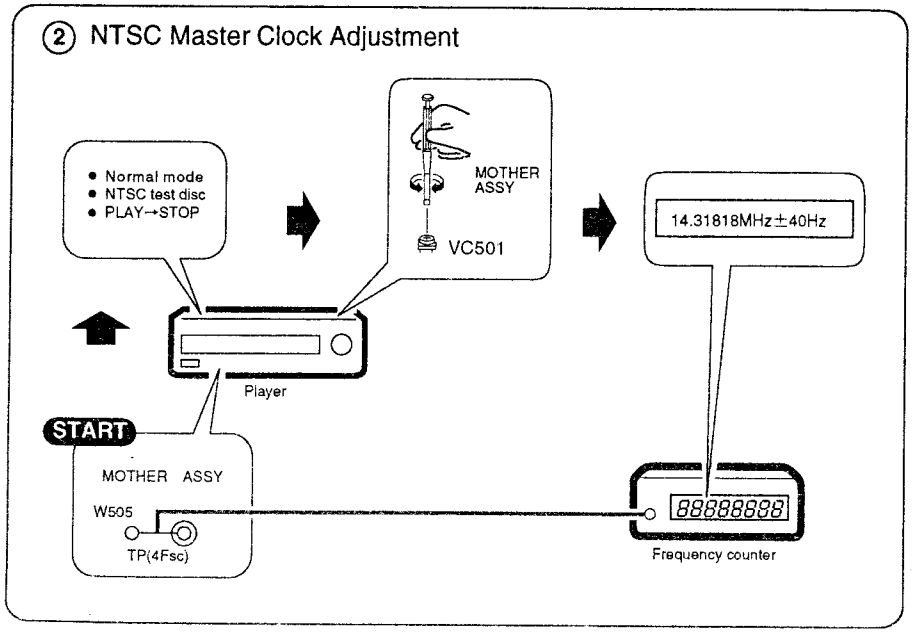
CLD - D515

8.7 ELECTRICAL ADJUSTMENT

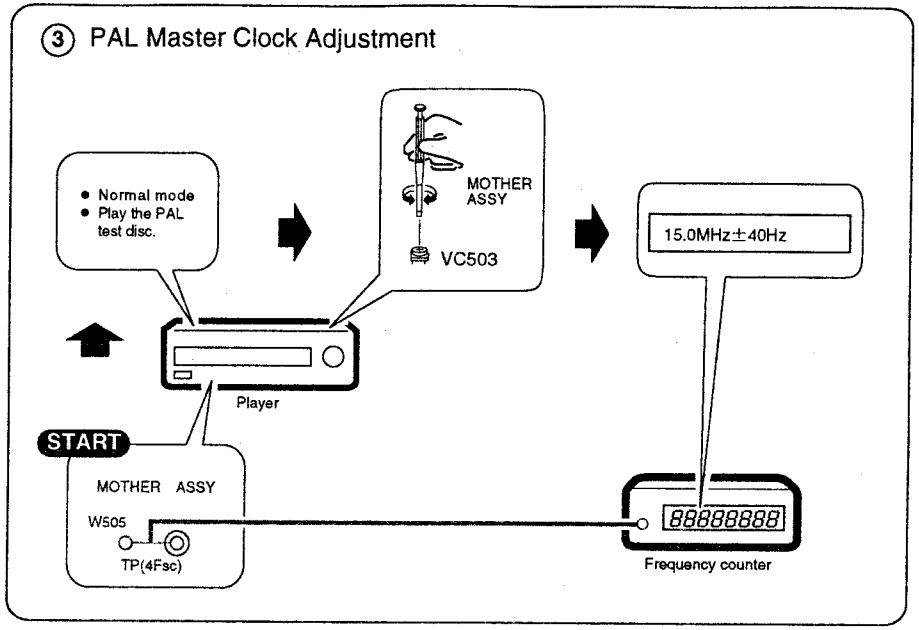
① PAL Master Clock Adjustment



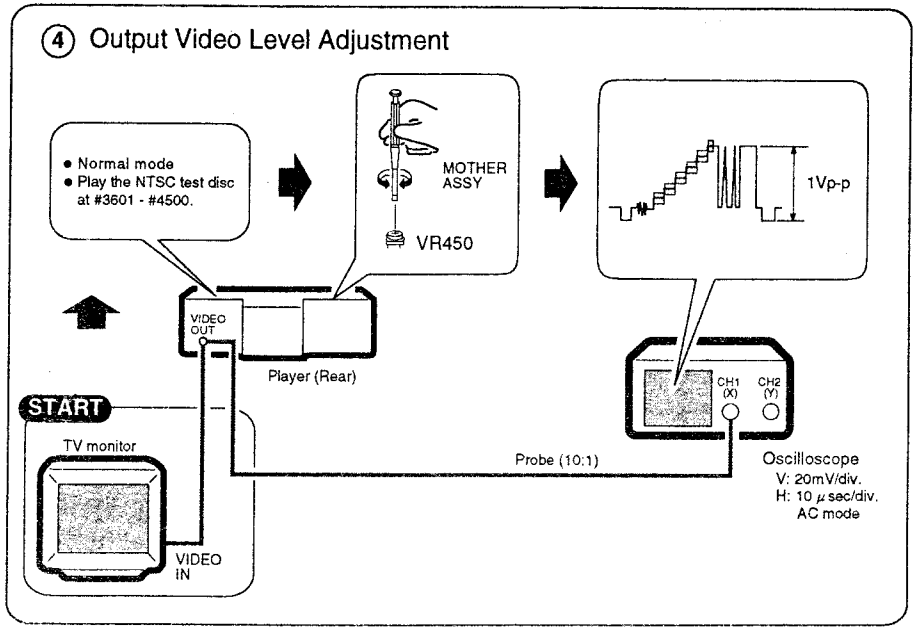
② NTSC Master Clock Adjustment

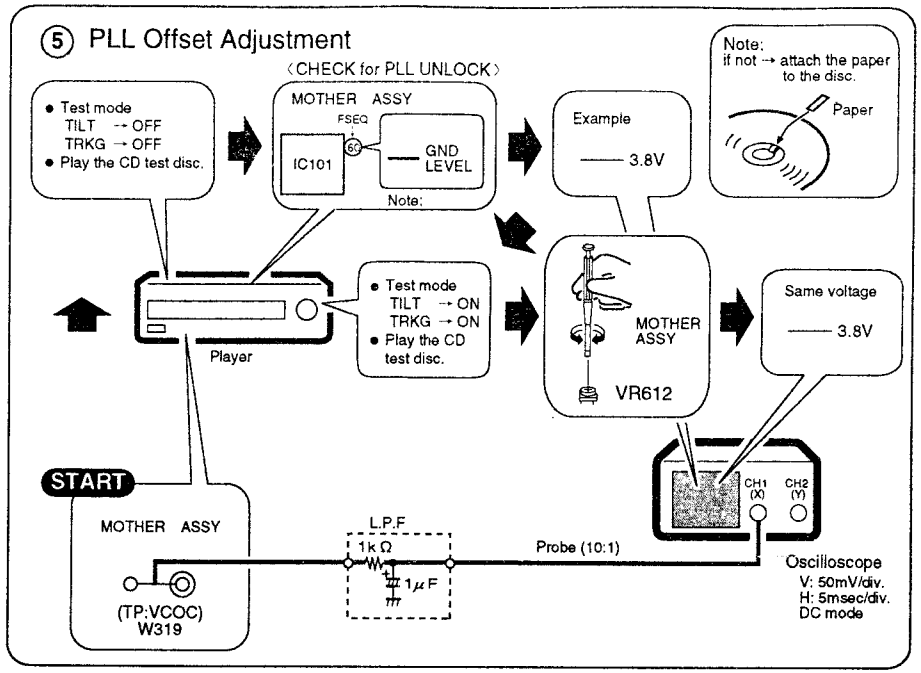


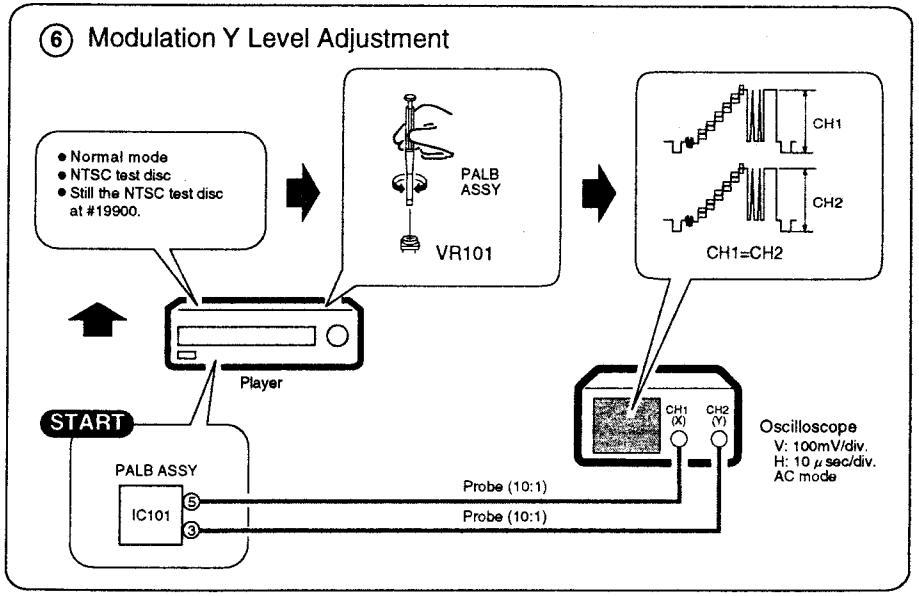
③ PAL Master Clock Adjustment



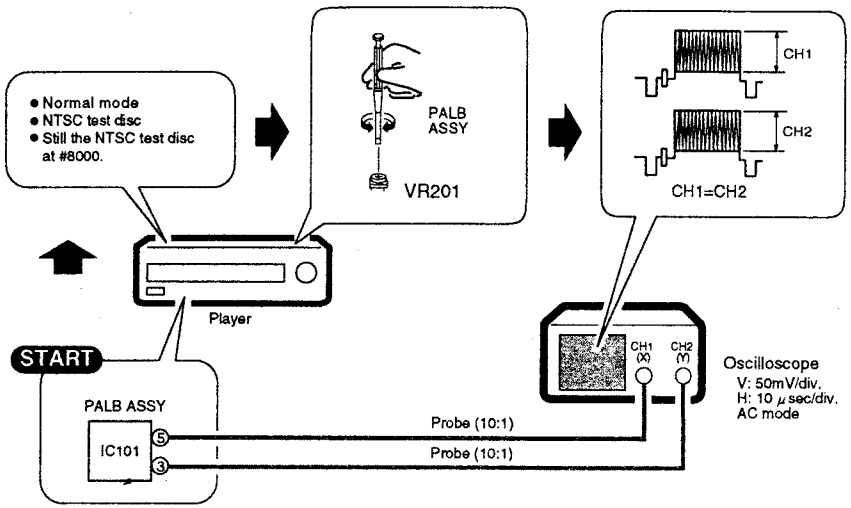
④ Output Video Level Adjustment



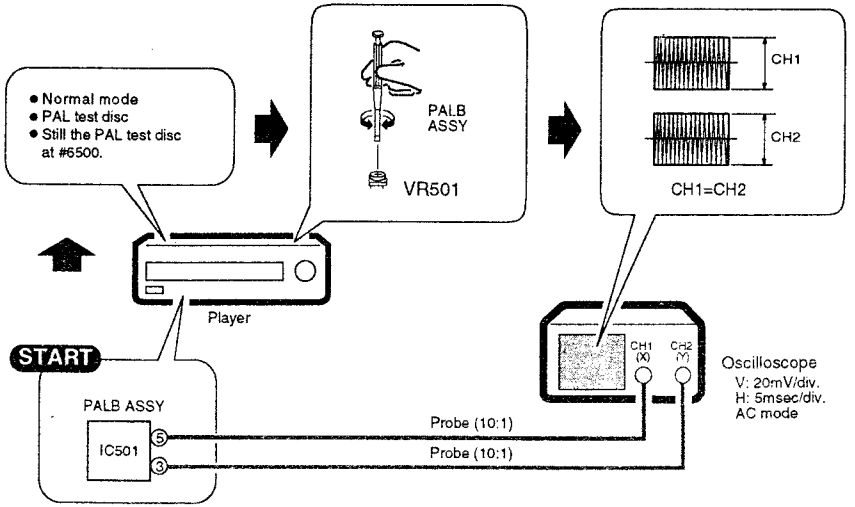

⑤ PLL Offset Adjustment
〈CHECK for PLL UNLOCK〉
• Test mode
TILT → OFF
TRKG → OFF
• Play the CD test disc.
MOTHER ASSY
FSEQ
IC101
GND LEVEL
Note:
Example
3.8V
Note:
if not → attach the paper to the disc.
Paper
Player
• Test mode
TILT → ON
TRKG → ON
• Play the CD test disc.
MOTHER ASSY
VR612
Same voltage
3.8V
START
MOTHER ASSY
(TP:VCOC)
W319
L.P.F
1kΩ
1μF
Probe (10:1)
CH1 (X)
CH2 (Y)
Oscilloscope
V: 50mV/div.
H: 5msec/div.
DC mode


⑥ Modulation Y Level Adjustment
• Normal mode
• NTSC test disc
• Still the NTSC test disc at #19900.
PALB ASSY
VR101
CH1
CH2
CH1=CH2
Player
START
PALB ASSY
IC101
5
3
Probe (10:1)
Probe (10:1)
CH1 (X)
CH2 (Y)
Oscilloscope
V: 100mV/div.
H: 10μsec/div.
AC mode

⑦ Modulation C Level Adjustment

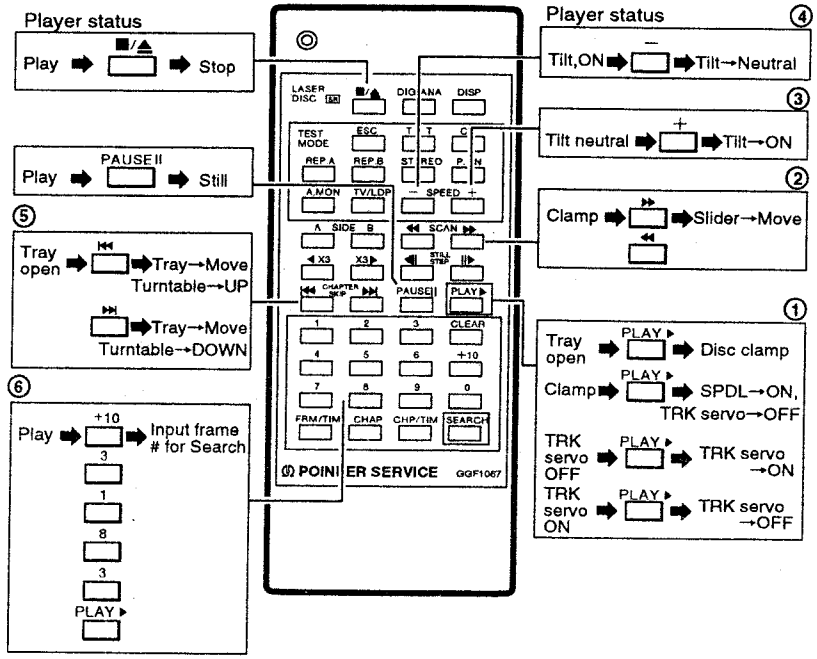


⑧ 1H Delay S.C. Level Adjustment

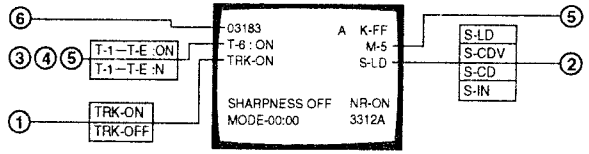


8.8 OPERATIONS IN THE TEST MODE

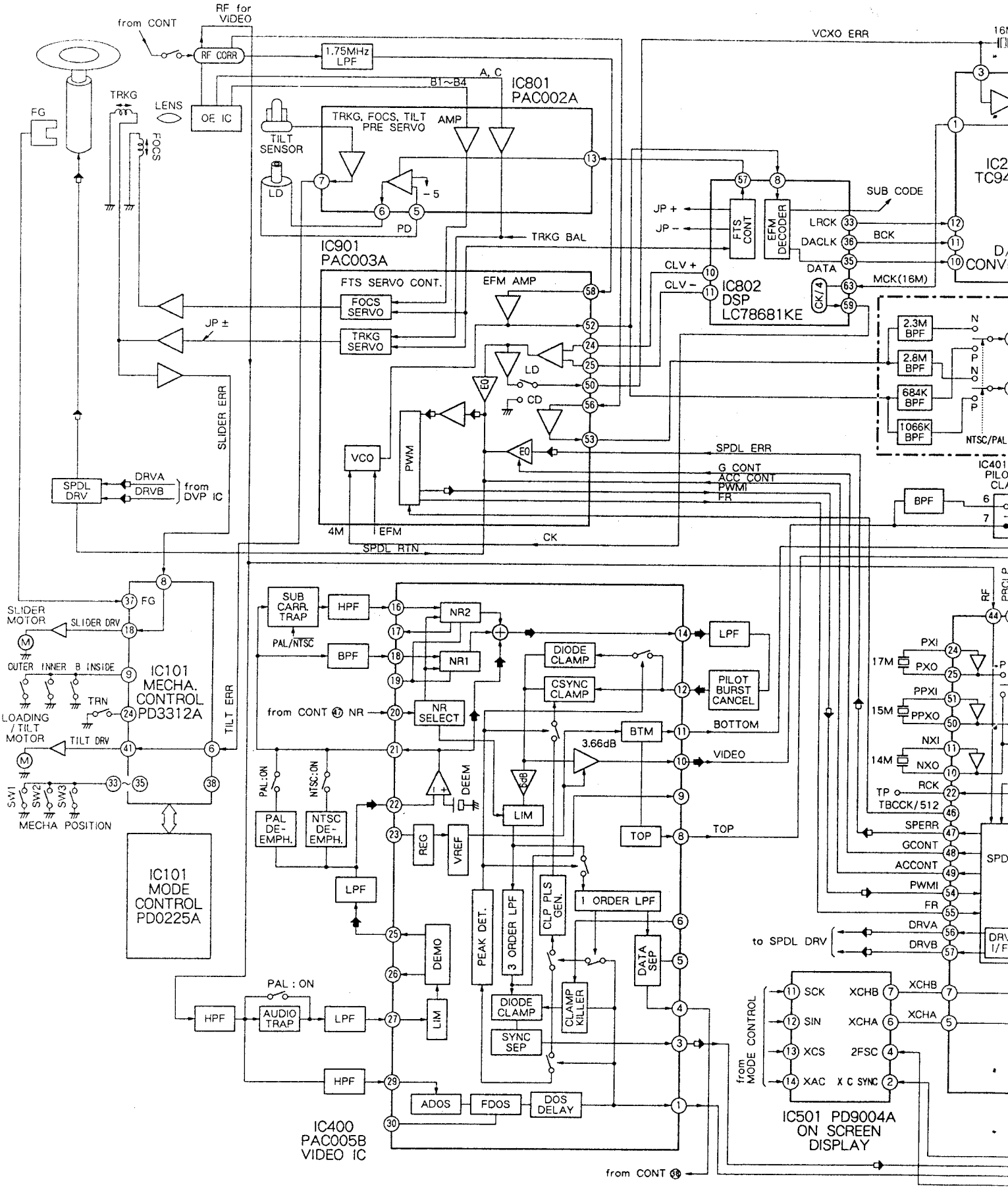
■ Test Mode Remote Control Unit (GGF1067)

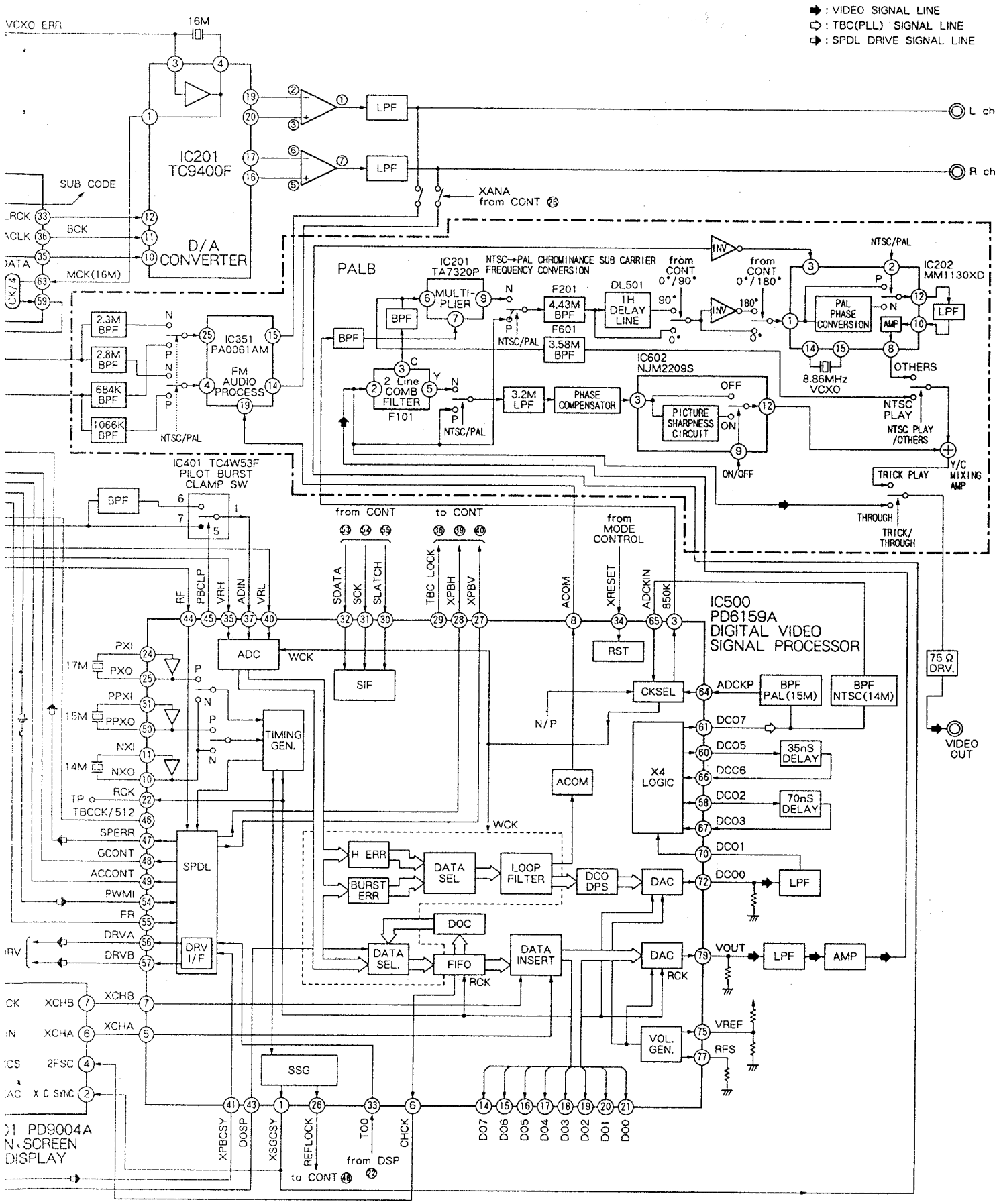


■ TV Monitor Display



9. BLOCK DIAGRAM




: VIDEO SIGNAL LINE
: TBC(PLL) SIGNAL LINE
: SPDL DRIVE SIGNAL LINE
VCXO ERR
16M
IC201
TC9400F
D/A
CONVERTER
SUB CODE
BCK
MCK(16M)
LPF
L ch
R ch
XANA
from CONT 25
PALB
IC201
TA7320P
NTSC→PAL CHROMINANCE SUB CARRIER
FREQUENCY CONVERSION
MULTI-
PLIER
BPF
F201
4.43M
BPF
F601
3.58M
BPF
DL501
1H
DELAY
LINE
90°
0°
180°
from
CONT
0°/90°
from
CONT
0°/180°
INV
NTSC/PAL
IC202
MM1130XD
PAL
PHASE
CONVERSION
AMP
LPF
8.86MHz
VCXO
OTHERS
IC602
NJM2209S
OFF
ON
PICTURE
SHARPNESS
CIRCUIT
ON/OFF
NTSC
PLAY
NTSC PLAY
/OTHERS
Y/C
MIXING
AMP
TRICK PLAY
THROUGH
TRICK/
THROUGH
2.3M
BPF
2.8M
BPF
684K
BPF
1066K
BPF
IC351
PA0061AM
FM
AUDIO
PROCESS
2 Line
COMB
FILTER
F101
3.2M
LPF
PHASE
COMPENSATOR
IC401 TC4W53F
PILOT BURST
CLAMP SW
from CONT
to CONT
from
MODE
CONTROL
SDATA
SCK
SLATCH
TBC LOCK
XPBH
XPBV
ACOM
XRESET
ADCKIN
850K
RF
PBCLP
VRH
ADIN
VRL
IC500
PD6159A
DIGITAL VIDEO
SIGNAL PROCESSOR
ADC
WCK
SIF
RST
CKSEL
ADCKP
BPF
PAL(15M)
BPF
NTSC(14M)
75Ω
DRV.
VIDEO
OUT
PXI
PXO
17M
PPXI
PPXO
15M
NXI
NXO
14M
RCK
TP
TBCCK/512
SPERR
GCONT
ACCONT
PWMI
FR
DRVA
DRVB
TIMING
GEN.
N/P
X4
LOGIC
DCO7
DCO5
DCO6
DCO2
DCO3
DCO1
DCO0
35nS
DELAY
70nS
DELAY
SPDL
DRV
I/F
H ERR
BURST
ERR
DATA
SEL
LOOP
FILTER
DCO
DPS
DAC
DOC
DATA
SEL.
FIFO
DATA
INSERT
VOUT
LPF
AMP
VOL.
GEN.
VREF
RFS
XCHB
XCHA
2FSC
X C SYNC
SSG
D07
D06
D05
D04
D03
D02
D01
D00
XPBCSY
DOSP
XSGCSY
REFLOCK
T00
CHCK
from DSP
to CONT 48
PD9004A
SCREEN
DISPLAY

10. HOW TO REPLACE THE FLEXIBLE CABLE

① Bend the flexible cable as shown below.

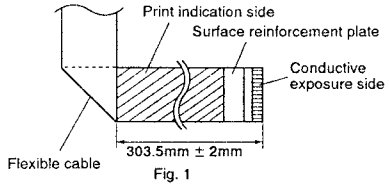


Fig. 1

② Put the bended portion to hook Ⓐ of the large hill.
③ Bend the flexible cable along the wall of large hill.

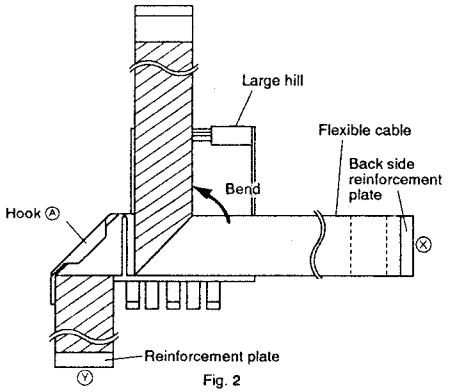


Fig. 2

④ Pull the flexible cable not to slackened after passing the Ⓧ edge side of flexible cable through the large hill as shown in Fig. 3.

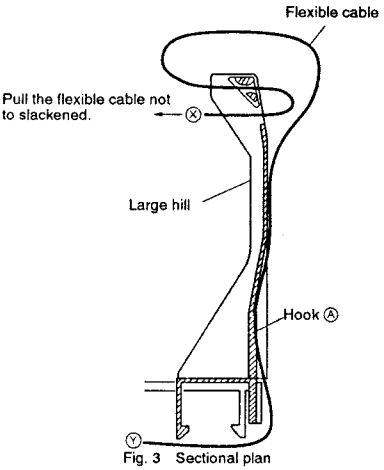


Fig. 3 Sectional plan

⑤ Put the flexible cable to hook Ⓑ after the Ⓨ edge side of flexible cable is bended along the hook Ⓑ position of the tilt base (lower), then insert to connector CN103 of the MOTHER assy.

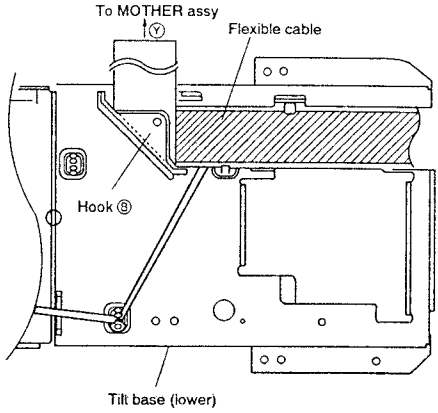


Fig. 4

⑥ Insert the Ⓧ edge side of flexible cable to connector of the carriage assy after passing through the FFC holder.
⑦ Move the FFC holder to touch the connector, lock the FFC holder to turn up the flexible cable to lower side.

Caution : Be sure to insert the MOTHER assy first of all for prevent the static electricity.

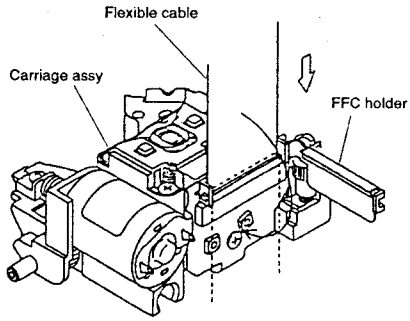
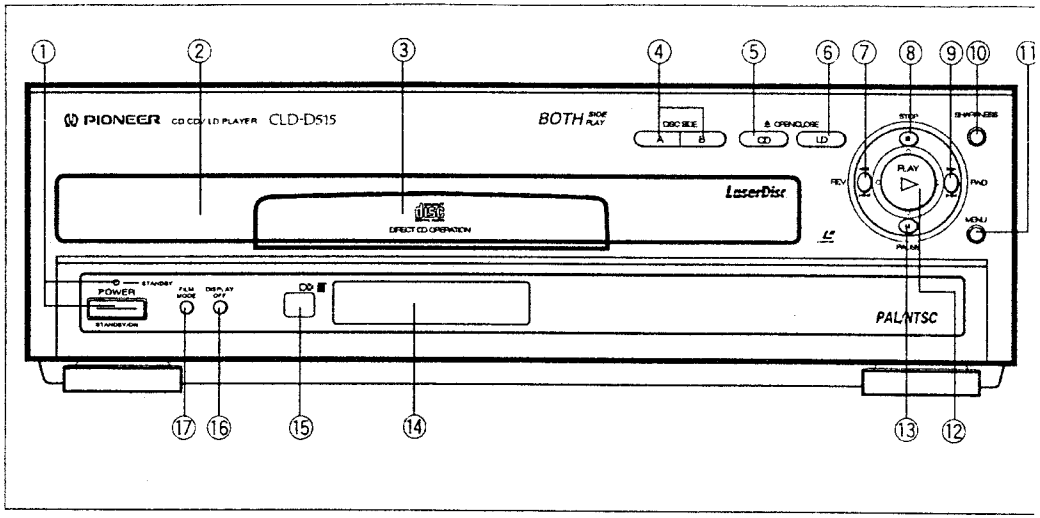


Fig. 5

11. PANEL FACILITIES



① **POWER STANDBY/ON switch and STANDBY indicator**
Press to turn the power on and off.
② **Disc table**
③ **CD disc table**
④ **DISC SIDE A/B buttons/indicator**
⑤ **CD OPEN/CLOSE (▲) button/indicator**
⑥ **LD OPEN/CLOSE (▲) button/indicator**
⑦ **Track/manual search (|◄◄ ◄◄) button**
⑧ **STOP button (■)**
⑨ **Track/manual search (►► ►►|) button**
⑩ **SHARPNESS button**
⑪ **MENU button**
⑫ **PLAY button (►)**
⑬ **PAUSE button (II)**
⑭ **Display window**
⑮ **Remote sensor**
⑯ **DISPLAY OFF button/indicator**
⑰ **FILM MODE button/indicator**

12. SPECIFICATIONS

1. General

System ..... LaserVision Disc system and Compact Disc digital audio system
Laser ..... Semiconductor laser wavelength 780 nm
Power requirements ..... AC 220 ~ 240 V, 50/60 Hz
Power consumption ..... 37 W
Weight ..... 6.8 kg
Dimensions ..... 420 (W) x 399 (D) x 132 (H) mm
Operating temperature ..... +5°C ~ +35°C
Operating humidity ..... 5% ~ 85%
(There should be no condensation of moisture.)

2. Video characteristics

Format ..... PAL/NTSC specifications
Video output
Level ..... 1 Vp-p nominal, sync. negative, terminated
Impedance ..... 75Ω unbalanced
Jack ..... RCA jack

3. Audio characteristics

Output level
During analog audio output ..... 200 mVrms (1 kHz, 40%)
During digital audio output ..... 200 mVrms (1 kHz, –20 dB)
Jacks ..... Both RCA jacks
Number of channels 2

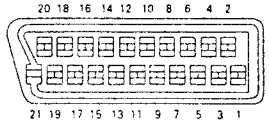
Digital Audio Characteristics

Frequency response	4 Hz - 20 kHz
SN ratio	110 dB (EIAJ)
Dynamic range	95 dB (EIAJ)
Total harmonic distortion	0.005 % (EIAJ)
Wow and flutter	Limit of measurement (EIAJ)

4. Other Terminals

Control input/output ..... Both miniature jacks
AV connector output ..... 21-pin connector
This connector provides the video and audio signals for connection to a colour video TV monitor (or TV set) which has a "AV CONNECTOR" terminal.

PIN assignment



PIN no. 1 Audio 2/R out
3 Audio 1/L out
4 GND
8 Status
17 GND
19 Video out
21 GND

5. Accessories

Remote control unit 1
Size "AAA" (IEC R03) dry cell batteries 2
Operating instructions 1
Warranty card 1

NOTE:
The specifications and design of this product are subject to change without notice, due to improvements.

PIONEER®
The Art of Entertainment

Service Manual

ORDER NO.
RRV1603

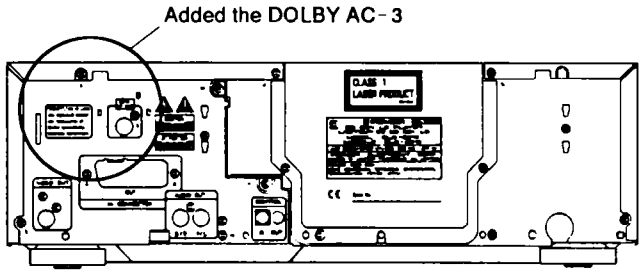
CD CDV LD PLAYER
CLD-D515

- **Refer to the service manual RRV1356 for CLD–D515.**

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model	Power Requirement	Remarks
	CLD-D515		
WEZ1	○	AC220-240V	
WBW1	○	AC220-240V	
WPW1	○	AC220-240V	

- **This product (WEZ1, WBW1 and WPW1 types) is the addition model which is added to the DOLBY AC-3 function with the current model (WEZ, WBW and WPW types).**



Rear view

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE, INC. P.O. Box 1760, Long Beach, CA 90801-1760, U.S.A.
PIONEER ELECTRONIC (EUROPE) N.V. Haven 1087, Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE PTE. LTD. 501 Orchard Road, #10-00 Lane Crawford Place, Singapore 0923
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T-IFM APR. 1996 Printed in Japan

1. CONTRAST OF MISCELLANEOUS PARTS

NOTES:

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex.1 When there are 2 effective digits(any digit apart from 0), such as 560 ohm and 47k ohm(tolerance is shown by J=5%, and K=10%).

560 Ω → 56 × 10¹ → 561 ····· RD1/4PU 5 6 1 J
47k Ω → 47 × 10³ → 473 ····· RD1/4PU 4 7 3 J
0.5 Ω → 0R5 ····· RN2H 0 R 5 K
1 Ω → 1R0 ····· RS1P 1 R 0 K

Ex.2 When there are 3 effective digits(such as in high precision metal film resistors).

5.62k Ω → 562 × 10¹ → 5621 ····· RN1/4PC 5 6 2 1 F

• FOR CLD-D515/WEZ1

WEZ1 and WEZ types have the same construction except for the following :

Mark	Symbol & Description	Part No.		Remarks
		WEZ type	WEZ1 type	
NSP	MOTHER ASSY	VWS1197 *	VWS1268	
	AC3B ASSY	Not used	VWV1499	No. 1
	Flexible Cable (7P)	Not used	VDA1468	No. 2
	Rear Panel L	VNA1575	VNA1779	
NSP	Front Panel	VNK3193	VNK3829	
	Rear Cover	VNK3272	VNK3828	
	Instruction Sheet (AC3)	Not used	VRL1002	
	Front Panel Assy-S	VXX2293	VXX2450	

Note : The number in the remarks column correspond to the numbers on the exploded diagram. Refer to "EXPLODED VIEW".
Note * : The design of MOTHER ASSY for CLD-D515/WEZ is changed from VWS1197 to VWS1268.

• FOR CLD-D515/WBW1

WBW1 and WBW types have the same construction except for the following :

Mark	Symbol & Description	Part No.		Remarks
		WBW type	WBW1 type	
NSP	MOTHER ASSY	VWS1197 *	VWS1268	
	AC3B ASSY	Not used	VWV1499	No. 1
	Flexible Cable (7P)	Not used	VDA1468	No. 2
	Rear Panel L	VNA1575	VNA1779	
NSP	Front Panel	VNK3193	VNK3829	
	Rear Cover	VNK3272	VNK3828	
	Instruction Sheet (AC3)	Not used	VRL1002	
	Front Panel Assy-S	VXX2293	VXX2450	

Note : The number in the remarks column correspond to the numbers on the exploded diagram. Refer to "EXPLODED VIEW".
Note * : The design of MOTHER ASSY for CLD-D515/WBW is changed from VWS1197 to VWS1268.

• FOR CLD-D515/WPW1

WPW1 and WPW types have the same construction except for the following :

Mark	Symbol & Description	Part No.		Remarks
		WPW type	WPW1 type	
NSP	MOTHER ASSY	VWS1197 *	VWS1268	
	AC3B ASSY	Not used	VWV1499	No. 1
	Flexible Cable (7P)	Not used	VDA1468	No. 2
	Rear Panel L	VNA1575	VNA1779	
NSP	Front Panel	VNK3193	VNK3829	
	Rear Cover	VNK3272	VNK3828	
	Instruction Sheet (AC3)	Not used	VRL1002	
	Front Panel Assy-S	VXX2384	VXX2449	

Note : The number in the remarks column correspond to the numbers on the exploded diagram. Refer to "EXPLODED VIEW".

Note * : The design of MOTHER ASSY for CLD-D515/WPW is changed from VWS1197 to VWS1268.

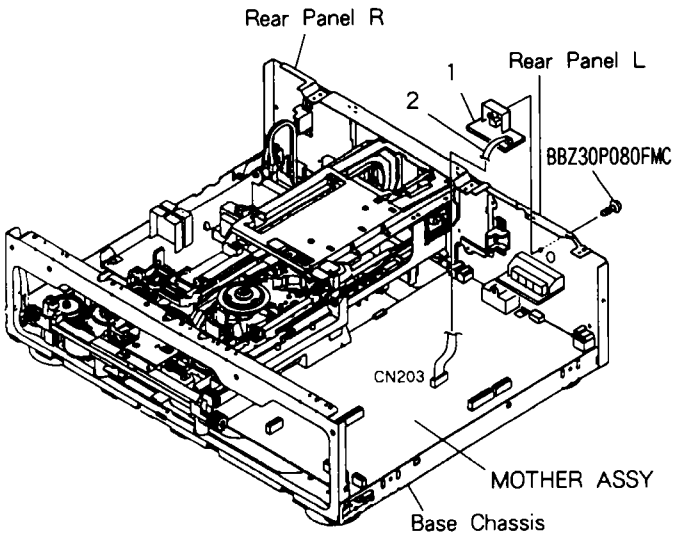
MOTHER ASSY

VWS1268 and VWS1197 have the same construction except for the following :

Mark	Symbol & Description	Part No.		Remarks
		VWS1197	VWS1268	
	CN203 7P FFC Connector	Not used	52045-0745	
	R194	Not used	RS1/10S000J	
	IC400	PAC005B	LA7133	*
	IC801	PAC002A	LA9425	*
	IC901	PAC003A	LA9420M	*
	R220,R222	DCN1001	RFA1/6PU4R7J	*

Note * : Although those parts are different in part number, they are interchangeable each other because of the same specifications.

■ EXPLODED VIEW



■ PCB PARTS LIST

Mark	No.	Description	Part No.
AC3B ASSY (VWV1499)			
SEMICONDUCTORS			
	Q301, Q302		2SC1740S
	Q303		DTA124ES
CAPACITORS			
	C301-C303		CKPUYF223Z25
RESISTORS			
	All Resistors		RD1/4PU□□□J
OTHERS			
	CN301	7P FFC CONNECTOR	52045-0745
	JA17	1P PIN JACK	VKB1077
	PIN JACK HOLDER		VNE2043

2. SCHEMATIC AND PCB DIAGRAMS

NOTE FOR SCHEMATIC DIAGRAMS

(Type 4A)

1. When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".

2. Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.

3. RESISTORS:
Unit: k:kΩ, M:MΩ, or Ω unless otherwise noted.
Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
Tolerance:(F):±1%, (G):±2%, (K):±10%, (M):±20% or ±5% unless otherwise noted.

4. CAPACITORS:
Unit : p:pF or μF unless otherwise noted.
Ratings : capacitor (μF) / voltage (V) unless otherwise noted.
Rated voltage : 50V except for electrolytic capacitors.

5. COILS:
Unit : m:mH or μH unless otherwise noted.

6. VOLTAGE AND CURRENT:
□ or ← V :
DC voltage (V) in PLAY mode unless otherwise noted.
⇦mA or ←mA :
DC current in PLAY mode unless otherwise noted.
Value in ( ) is DC current in STOP mode.

7. OTHERS:
● ⊘ or ⊘ : Adjusting point.
● ◁ : Measurement point.
● The ⚠ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.

8. SCH – □ ON THE SCHEMATIC DIAGRAM:
● SCH-□ indicates the drawing number of the schematic diagram. (SCH stands for schematic diagram.)

9. SWITCHES (Underline indicates switch position):

LMSB ASSY
S101 : SW1
S102 : SW2
S103 : SW3

PKSB ASSY
S104 : OUTER SW
S105 : INNER SW

TNSB ASSY
S111 : TURN

BISB ASSY
S112 : B INSIDE

KEYB ASSY
S201 : DISC SIDE A
S202 : DISC SIDE B
S203 : CD OPEN/CLOSE (▲)
S204 : LD OPEN/CLOSE (▲)
S205 : STOP (■)
S206 : SHARPNESS
S207 : REV (◀◀ / ⏮)
S208 : FWD (⏭ / ▶▶)
S209 : PLAY (▶)
S210 : PAUSE (❚❚)
S211 : MENU

FLKY ASSY
S101 : POWER STANDBY/ON
S102 : FILM MODE
S101 : DISPLAY OFF

NOTE FOR PCB DIAGRAMS:

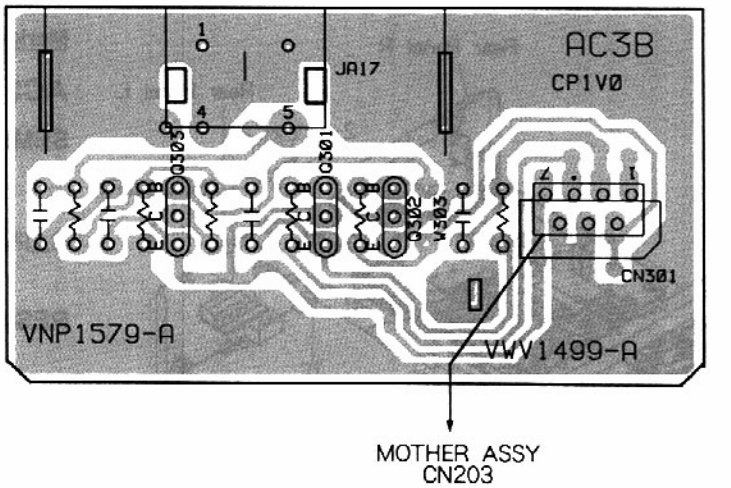
1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
B C E	B C E B C E	Transistor
B C E	B C E B C E	Transistor with resistor
D G S	D G S D G S	Field effect transistor
		Resistor array
		3-terminal regulator

● PCB DIAGRAM OF AC3B ASSY

AC3B ASSY

PCB-1F

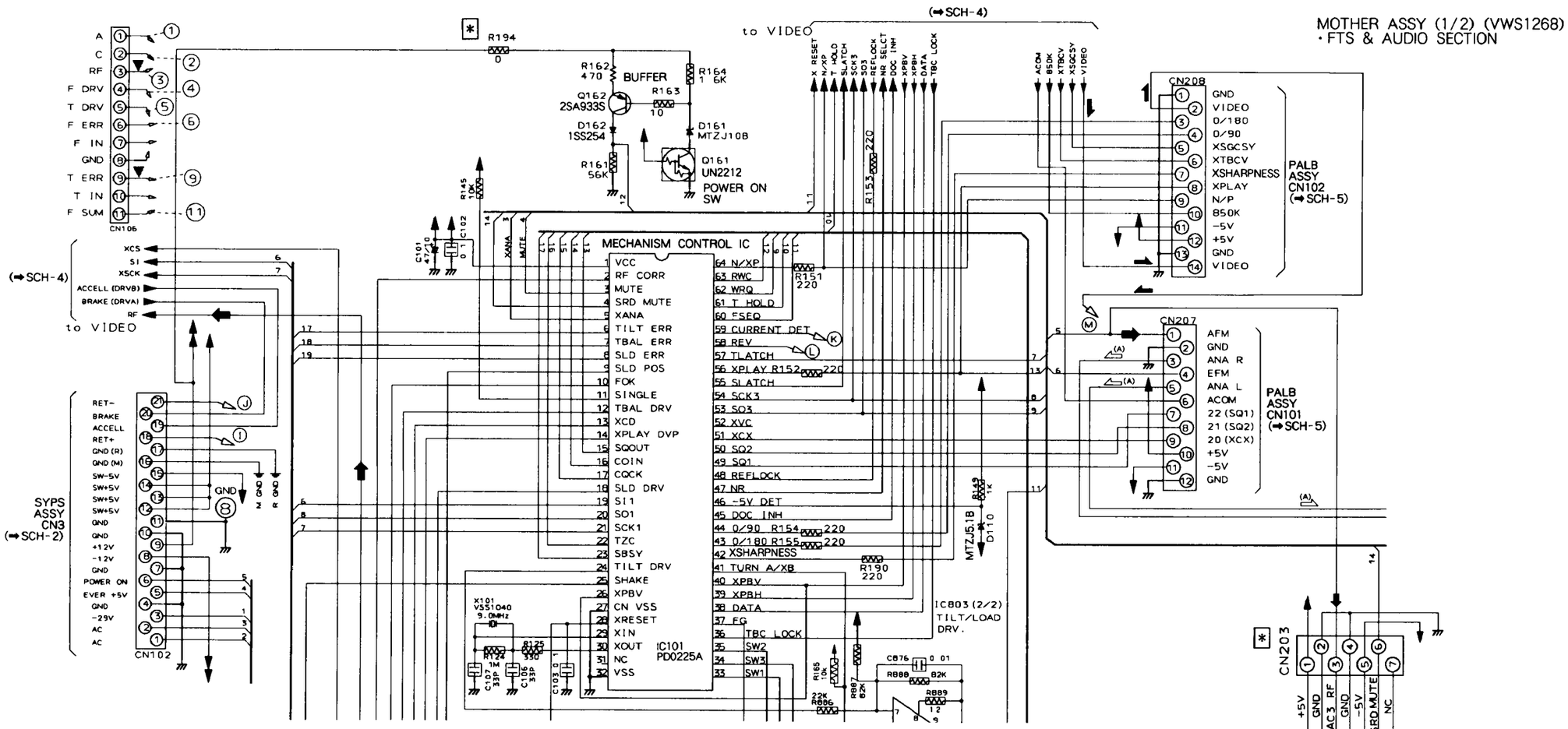


- This diagram is viewed from the mounted parts side.
- The parts mounted on this PCB include all necessary parts for several destinations.
  For further information for respective destinations, be sure to check with the schematic diagram.

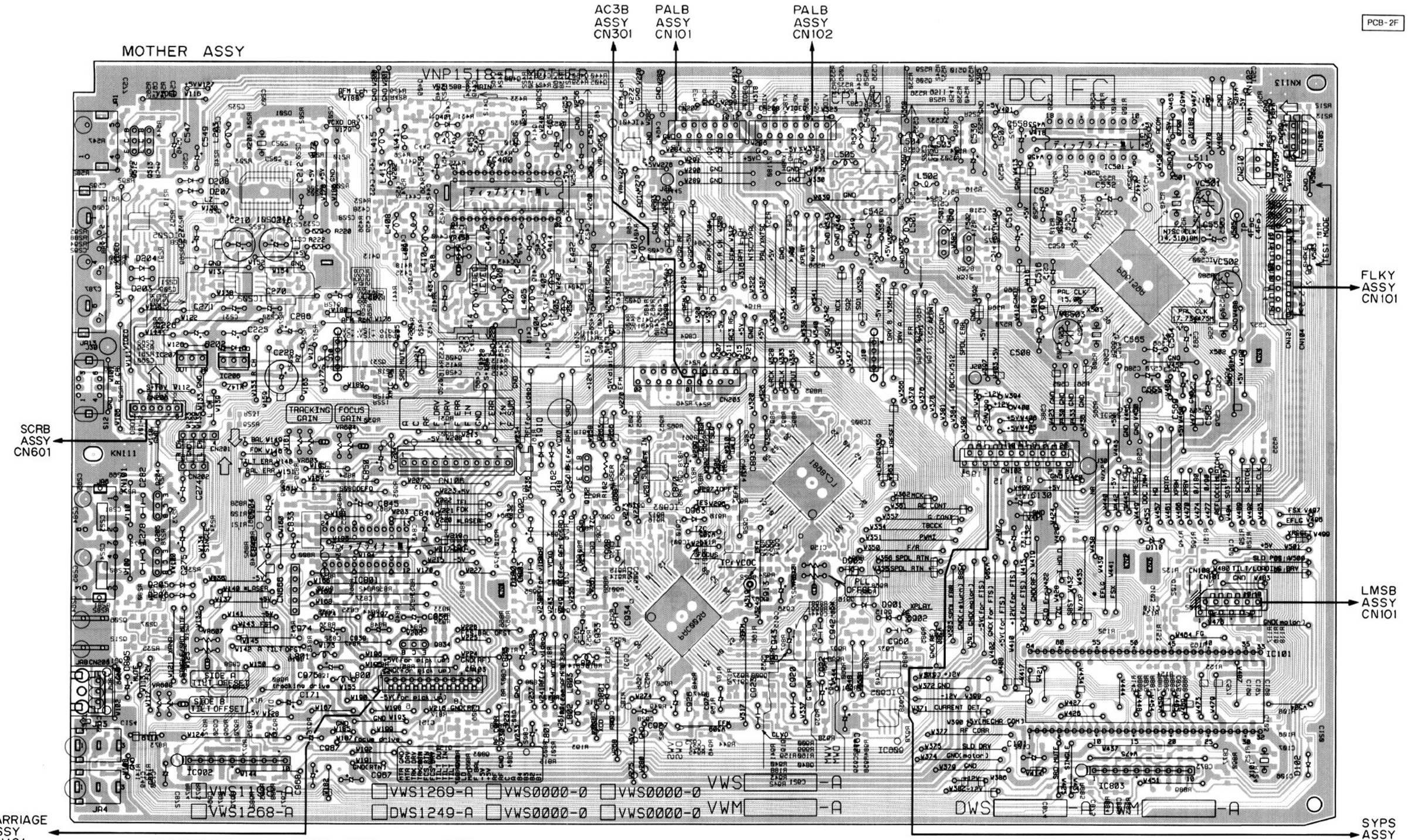
2.1 MOTHER ASSY(1/2 : FTS & AUDIO SECTION) AND AC3B ASSY

Note : Parts marked [*] are added to VWS1197.

SCH-1F



CLD - D515



- This diagram is viewed from the mounted parts side.
- The parts mounted on this PCB include all necessary parts for several destinations.
  For further information for respective destinations, be sure to check with the schematic diagram.